KIMO INSTRUMENTS

Technical Data Sheet

Pressure • Temperature • Humidity • Air Velocity • Airflow • Sound level



Pressure transmitter

CP 300

New

CE

- *Ranges from 0/+10 Pa to -10 000/+10 000 Pa (according to model)*
- *Transmitter resolution at 0.1 Pa on CP 301 (optional)*
- *Configurable intermediate and centre zero ranges*
- *Air velocity and airflow functions (optional)*
- *Interchangeable measuring sensor (SPI technology)*
- *Simultaneous display of 1 to 4 parameters*
- *External transmitter inputs (KIMO Class 200 and 300) and thermocouple K*
- *2 outputs 4-20 mA (4 wires) or 0-10V, RS 232, 2 RCR relays 6 A/230 Vac*
- *2 visual (dual color LED) and audible (buzzer - 80 dB) alarms*
- *Output diagnostics*
- *MODBUS network RS 485 system (optional)*
- *ABS or ALU IP 65 housing, with or without backlit graphic display*
- *Quick and easy mounting using "1/4 turn" system with wall-mounting plate*

Housing made of **ALU** or **ABS**



WITH or WITHOUT **display**



Part number

To order, just add the codes to complete the part number :

Measuring range

1	-100/+100 Pa
2	-500/+500 Pa
3	-1000/+1000 Pa
4	-10 000/+10 000 Pa

For the intermediate and centre zero ranges, see "Configuration".

Power supply / Output

B	24 Vac/Vdc • 0-10 V or 4-20 mA
M	115 Vac • 0-10 V or 4-20 mA
H	230 Vac • 0-10 V or 4-20 mA

Display

O	With display
N	Without display

Housing material

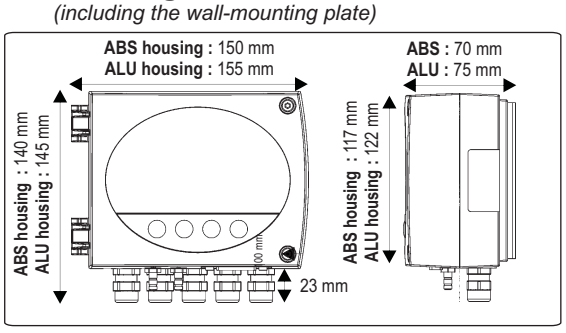
P	ABS
A	ALU

CP30 [ ] - [ ] [ ] [ ]

Example : CP302-BOA = pressure transmitter type CP 300, with measuring range of -500/+500 Pa, with power supply 24 Vac/Vdc, 0-10 V or 4-20 mA output, with display and alu housing.

Housing dimensions

(including the wall-mounting plate)



Transmitter features

Pressure

Measuring range .....see "SPI features"
Units of measurement.....Pa, mmH_2O, mbar, inWG, mmHG
Accuracy *.....±0,5% of reading ±1 Pa (SPI-100/500/1000)
±0,5% of reading ± 0.8 Pa (CPI-100/0.1Pa)
±0,5% of reading ±10 Pa (SPI-10000)
Zero drift .....none (see "self-calibration")
Resolution .....1 Pa - 0,1 mmH_2O - 0,01 mbar - 0,01 InWG - 0,01 mmHg
Self-calibration .....push-button or automatic (configurable)
Type of fluid.....air and neutral gases

*All accuracies indicated in this technical data sheet were stated in laboratory conditions, and can be guaranted for measurements carried out in the same conditions, or carried out with calibration compensation.

Functions (optional)

Class 300 transmitters have 2 analogue outputs which correspond to the first 2 parameters displayed. You can activate 1 or 2 outputs, and for each output, you can choose between pressure, temperature (optional probe), air velocity and airflow (optional functions).

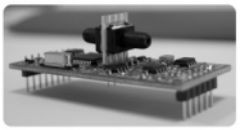
Features / *Functions*	*Measuring ranges*	*Units and resolutions*
Air velocity*	2 to 100 m/s (according to SPI card)	0,1 m/s - 0,1 fpm
Airflow*	0 to 100 000 m^3/h (depends on air velocity and duct dimensions)	1 m^3/h - 0,1 m^3/s 0,1 l/s - 1 cfm

Class 300 transmitters can display up to 4 parameters simultaneously.
The last 2 parameters are only displayed, they have no output.
* differential probe (Pitot tube, Debimo blade...) sold separately

Housing features

Housing .....ALU or ABS
Fire-proof classification .....ABS : V 0 as per UL94
Dimensions .....see drawing alongside
Protection IP65
Display.....graphic from 1 to 4-line, 70 mm x 38 mm backlit, protection screen made of PMMA
Fittings.....barbed fittings Ø 6,2 mm
Connection gland .....ALU : nickel plated brass for cables Ø 9 mm max.
ABS : polyamide for cables Ø 7 mm max.
Weight.....ABS : 800 g - ALU : 1300 g (with display)

SPI system features
Interchangeable Pressure Sensor



The SPI board (Interchangeable Pressure Probe) includes a piezoresistive sensitive element with its digital electronic system. This system is individually adjusted and records all the calibration parameters.
Via the automatic recognition by the transmitter, this digital board is totally interchangeable. Maintenance, service and calibration are easily performed on site, with no need to stop the process.

Configurable intermediate and centre zero ranges

Ref. of the probe	**Pressure** range	**Air velocity*** range
SPI 100	-100/+100Pa	2 to 10 m/s
SPI 500	-500/+500 Pa	2 to 22 m/s
SPI 1000	-1000/+1000 Pa	2 to 30 m/s
SPI 10000	-10 000/+10 000 Pa	2 to 100 m/s

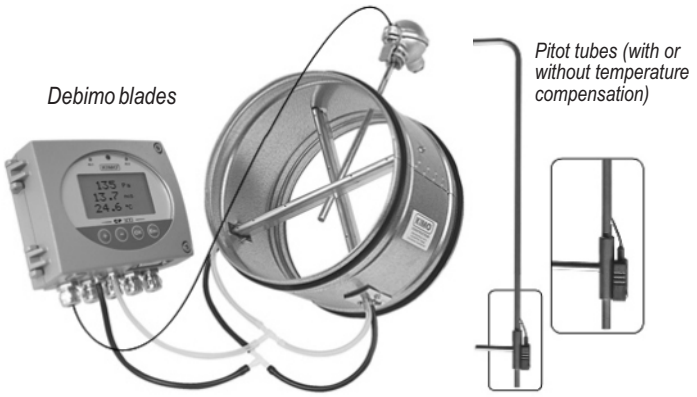
* Air velocity ranges are given as an indication based on a differential probe DEBIMO (Cm = 1). They do not take into account temperature compensation.

The minimum configurable range is 10% of the full range.

Overpressure tolerated.....25 000 Pa (CP 301, CP 302, CP 303)
70 000 Pa (CP 304)
Response time .....1/e (63%) 0,3 sec.
Type .....digital
Dimensions .....L = 60 mm, l = 25 mm
Working temperature .....0 to +50 °C
Storage temperature .....-10 to +70 °C

Air velocity and airflow functions (optional)

Pressure transmitters working with a differential probe (such as DEBIMO, Pitot tube, orifice plate...) can be configured with a square root function. Via this function, and from the differential pressure, the transmitter can calculate air velocity and/or airflow in a duct.



Air velocity calculation function :

$$\text{Air velocity (m/s)} = C_M \times C_C \times C_T \times \sqrt{\text{pressure Pa)}}$$

C_M : cœfficient of the differential probe
C_C : coefficient to adapt the measuring system to the specifications of your air movement conditions .
C_T : temperature compensation coefficient, with the formula below :

$$C_T = \sqrt{\frac{574{,}2 \times \text{temp. (°C)} + 156842{,}77}{101325}}$$

Airflow calculation function :

Airflow (m^3/h) = air velocity (m/s) x surface (m^2) x 3600

Surface : setting of duct type (rectangular or circular) and duct dimensions (in mm or in inches).

Measurement and temperature compensation

Temperature compensation can be made either manually (by entering a temperature value) or automatically via a thermocouple K temperature probe (optional). This probe can measure and display temperature, and can compensate air velocity formula in real-time (for better accuracy).

Type of transmitter.....Thermocouple K (optional)
Measuring range .....-200 to +1300 °C (probe dependent)
Units of measurement .....°C, °F
Resolution.....0,1°C - 0,1°F

Technical Specifications

Power supply .....24 Vac / Vdc ±10%
115 Vac or 230 Vac ±10%, 50-60 Hz
Output.....2 x 4-20 mA or 2 x 0-10 V (4 wires)
maximum load : 500 Ohms (4-20 mA)
minimum load : 1 K Ohms (0-10 V)
Galvanic isolation.....inputs and outputs (on 115 Vac/230 Vac models)
outputs (on 24 Vac/Vdc models)
Consumption.....5 VA
Relays .....2 RCR relays 6A / 230 Vac
Visual alarms.....2 dual color LED
Audible alarm .....buzzer
Electro-magnetical compatibility ...EN 61 326
Electrical connection .....screw terminal block for cables Ø 1.5 mm² max
RS 485 communication .....digital : Modbus RTU system
communication speed configurable from 2400 to 115200 Bauds
RS 232 communication .....digital : ASCII, proprietary protocol
Working temperature.....0 to +50°C
Storage temperature.....-10 to +70°C
Environment.....air and neutral gases

Relays and Alarms

Class 300 transmitters has 4 stand-alone and configurable alarms :
2 visual alarms (dual color LED) and 2 relays (contacts).

You can set :

- the parameter (pressure, air velocity, temperature…)
- 1 or 2 set points (rising and falling action) for each alarm
- the time-delay / 60 sec max.
- the alarm action (rising or falling)
- the relay operation mode : positive or negative security
- the audible alarm (buzzer) activation.

Self calibration

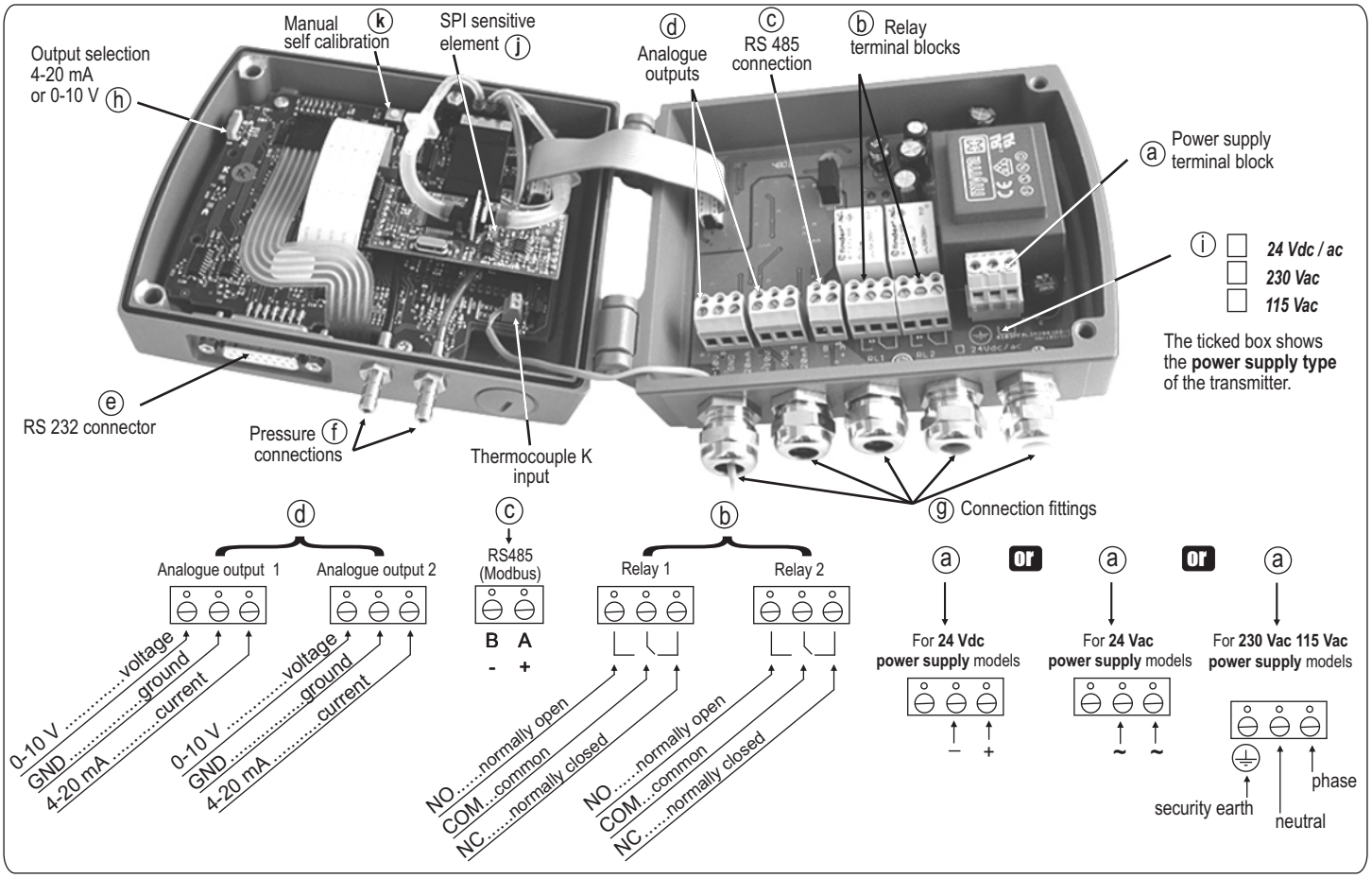
Thanks to the temperature compensation of the gain (from 0 to 50°C) and to the self calibration system, Class 300 transmitters guarantee an excellent long-term stability, along with a great measurement accuracy.
Self calibration principle : the microprocessor drives an electro-valve that compensates for any long-term drift of the sensitive element.
Compensation is made by regular automatic adjustment of the zero. True differential pressure measurement is then made regardless of the environmental conditions of the transmitter.

Electro-valve lifetime .....100-million cycles
Benefit.....no zero drift
Self calibration frequency .....can be disabled or set between 1 and 60 min

Integration of pressure measurement

The pressure measurement element is very sensitive and reacts to pressure changes. When making measurements in unstable air movement conditions, the pressure measurement may fluctuate. The integration coefficient (from 0 to 9) makes an average of the measurements ; this helps to avoid any excessive variations and guarantees a stable measurement.

Connection



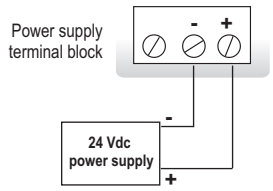
Electrical connections - *as per* **NFC15-100** *Norm*

⚠ This connection must be made by a qualified technician. **Whilst making the connection, the transmitter must not be energized.**

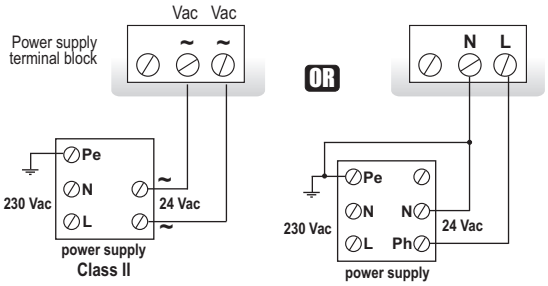
■ **Power supply** connection :

⚠ **Before making the connection, you must first check the power supply which is indicated on the transmitter board (see ⓘ on the connection drawing).**

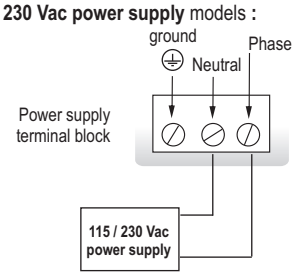
• For **24 Vdc power supply** models :



• For **24 Vac power supply** models :

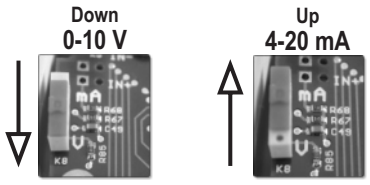


• For **115 or 230 Vac power supply** models :



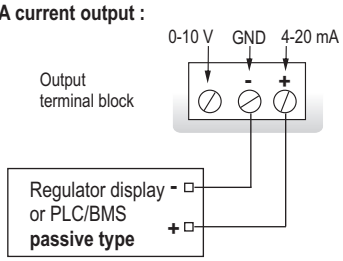
■ **Output signal** selection **voltage (0-10 V) or current (4-20 mA)**

The on-off switch located on the left top of the transmitter (see ⓗ on connection drawing) allows selection of the required outputs.

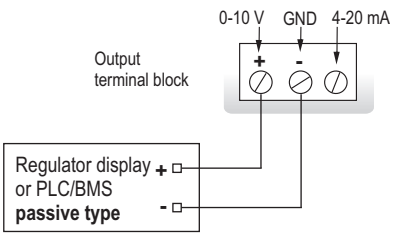


■ **Output** connection :

• **4-20mA current output :**

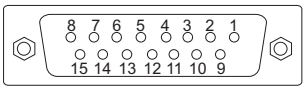


• **0-10 V voltage output :**



■ Connection of **SUB-D15**

RS 232 and RS 485 (Modbus)
(see ⓔ on drawing connection)



Pin #	Description
1	NC *
2	NC *
3	NC *
4	B - (RS 485)
5	A + (RS 485)
6	NC *
7	NC *
8	NC *
9	RX (RS 232)
10	NC *
11	TX (RS 232)
12	NC *
13	NC *
14	NC *
15	GND (RS 232)

⚠ CAUTION ! :
NC * = DO NOT CONNECT

Numerical communication

RS 232 communication

• Via the RS 232 connection, the CP 300 **can display 1 or 2 parameters that are measured by other Class 200 and 300 transmitters.**
Benefit : the CP 300 can display (in addition to the pressure), other parameters such as temperature and humidity from a TH 200 (for example).

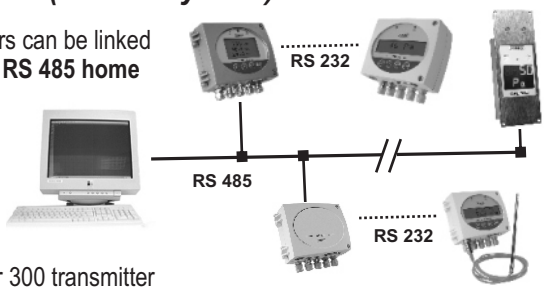


• Via the RS 232 connection, you can also configure your transmitter with the LCC-300 software.

• The RS 232 connection cable is available in 2m, 5m or 10m (maximum) lengths.

Modbus network (RS 485 system)

• Class 300 transmitters can be linked **in one network, on a RS 485 home bus. They can also be integrated into an existing network.**



• When a Class 200 or 300 transmitter is connected to a CP 300 (with RS 232 connection), all the measurements can be given to the PLC/BMS via the RS 485, **with only one address for the 2 transmitters.**

• The RS 485 digital communication is a 2-wire network, on which the transmitters are connected in parallel. They are connected to a PLC/BMS via the RTU Modbus communication system. Since the CP 300 can be configured with the keypad, the MODBUS enables remote configuration, to measure 1 or 2 parameters or to see the status of the alarms...

Configuration

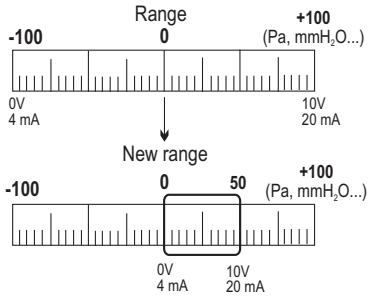
You can configure all the parameters of the transmitter : **units, measuring ranges, alarms, outputs, channels, calculation formula....** via the different methods shown below.

- **Via keypad :** only on models with display
  A code-locking system for keypad guarantees the security of the installation. See configuration manual.
- **Via remote control** (optional) only on models with display.
  This is convenient to configure the transmitters located in hard to reach positions. Same method as with a keypad.
- **Via software** (optional) : on all models.
  Simple and user-friendly configuration. See LCC-300 user manual.
- **Via MODBUS** (optional) : on all models.
  Configuration of all parameters from your PC, via the supervision or data acquisition software.

Configurable analogue outputs

Configure the range according to your needs : outputs are automatically adjusted to the new measuring ranges.

Range with centre zero (-50/0/+50 Pa), with offset zero (-30/0/+70Pa) or standard range (0 /+100 Pa) => you can configure your own intermediate ranges according to your needs, between 10% and 100% of the full scale. The minimum configurable range is 10% of the full scale.



Calibration

Adjusting and calibration on site :

The professional configuration interface, with a dynamic pressure calibration bench, enables you to adjust and calibrate your transmitters directly on site or in laboratories.





Output diagnostics :

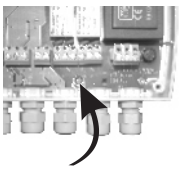
With this function, you can check with a multimeter (or on a regulator/display, or on a PLC/BMS) if the transmitter outputs work properly. The transmitter generates a voltage of 0 V, 5 V and 10 V or a current of 4 mA, 12 mA and 20 mA.

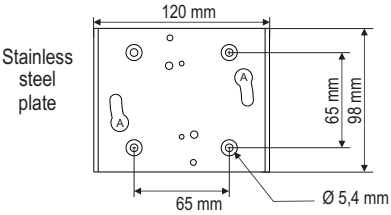
Certificate :

- Class 300 transmitters are supplied with adjusting certificates. Calibration certificates are offered as an option.
- The SPI sensitive elements (interchangeable pressure probes) are supplied with adjusting certificates.

Mounting

To install the transmitter on a wall : fix the stainless steel plate to the wall (this plate is supplied with the transmitter). Drilling : 8 mm (with the screws and wall-plugs supplied with the transmitter). Insert the transmitter on the plate (see A on the drawing shown beside) by aligning it at 30°. Rotate its housing in clockwise direction until you hear a "click" which confirms that the transmitter is correctly installed. Then, open the housing, lock the clamping system of the housing on the plate, with the screw as shown. (to remove the transmitter from the plate, remember to remove the screw first).





CAUTION !

When the transmitter is installed and powered on, it will automatically perform an autozero procedure. This guarantees that the transmitter works properly, whatever its position.

Maintenance

Avoid aggressive solvents.
Protect the transmitter and probes from any cleaning product containing formol, which may be used for cleaning rooms or ducts.

Options

- SQR/2 (square root extraction) function for the calculation of air velocity and airflow
- Digital output for Modbus network (RS 485 system)
- LCC-300 configuration software with RS 232 cable
- Infrared remote control for configuration (only for models with display)
- Calibration certificate.
- Transmitter resolution at 0.1 Pa (CP 301)

Optional accessories

- Pitot tubes
- Debimo measuring blades
- Thermocouple K probes
- Mounting brackets
- Sliding fittings
- Connection gland
- Clear tube
- Through-connections
- Pressure connections

Ref. FT ang - CP 300 - 16/08/11 - RCS (24) Périgueux 349 282 095 Non-contractual document - We reserve the right to modify the characteristics of our products without prior notice.

大華高科股份有限公司
www.taiwah.com.tw info@taiwah.com.tw
台北 TEL: (02)2592-5119 Fax: (02)2592-3577
台中 TEL: (04)2707-2269 Fax: (04)2707-1799
台南 TEL: (06)243-2338 Fax: (06)243-2339