

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130  
Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139  
Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

EQUIPMENT UNDER TEST :  
APPARECCHIO IN PROVA :

PROGRAMMABLE INSPECTOR WITH GSM WISMO  
Q2426B WITH FUNCTION OF ALARM AIR CONTACT

REFERENCE STANDARDS:  
NORME DI RIFERIMENTO :

FCC RULES PART 22 and 24  
MODEL: AIR CONTACT

**Customer:**

*RICHIEDENTE:*

1. **Dept. / Firm :** ATLAS COPCO AIRPOWER NV  
*Ente / Società:*

2. **Mr.:** Sig. Claudio Guariso  
*Sig.:*

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*Telefono :* *Fax :*

**Site of test execution:** Via Campagna, 92 - 22020 Gaggino Faloppio (CO) - Italy  
*Località esecuzione prove:*

**Date of test samples receipt:** 07/12/2006  
*Data ricevimento campioni:*

**Date of start test:** 11/05/2007  
*Data inizio prove:*

**Date of end test:** 14/05/2007  
*Data fine prove:*

**Witness to the test:**  
*Presenti alle prove:*

**Signature of the engineers:**  
*Firma esecutore prove:*

**Signature of the Laboratory Director:**  
*Firma Direttore Laboratori:*

Nobody / Nessuno  
.....

.....  
Giovanni Molteni

.....  
Massimo Maltempi

The test results recorded in this Test Report are exclusively referred to the tested samples.

*I risultati del presente rapporto di prova si riferiscono esclusivamente al campione sottoposto a prova.*

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## **1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)**

### **1.1 Identification**

Brand name: ATLAS COPCO AIRPOWER NV  
Manufacturer: PRIMA ELECTRONIC S.P.A.  
Equipment : GSM / GPRS Module  
Model name : AIR CONTACT  
Country of manufacturer: ITALY

### **1.2 Technical data**

Class: FCC RULES PART 22 and 24  
FCC ID: UXQAIRCONTACT  
Supply voltage: 100-240V 50-60Hz 10VA  
EUT standing: Wall  
EUT single or system: Single  
EUT dimensions : 130 x 55 x 120 mm  
GSM module manufacturer WAVECOM  
Module type : WISMO Q2426B  
Type of antenna : ☐ Integral ;  
☒ External ;  
☐ Dedicated  
Frequency range TX - GSM 850 824.2 – 848.80 MHz  
Frequency range TX - PCS 1850.2 – 1909.8 MHz  
Frequency range RX – GSM 850 869.2 – 893.8 MHz  
Frequency range RX – PCS 1930.2 – 1989.8 MHz  
Antenna gain -1 dBi  
Power supply 3.7 V  
Operating mode Duplex  
Type of modulation GMSK (GSM modulation)  
Emission GXW  
Software Fully GSM software Stack  
Temperature range Operating: -20°C to +55°C  
Storage: -30°C to +85°C

### 1.3 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test :

- None

### 1.4 Ports identification

This section contains descriptions of all signal ports and AC/DC power input/output ports, the length and the type of the cable provided by manufacturer needed for the tests.

Moreover it is specified if the ports are ever or optionally connected.

| Port  |                             | Description                   | Connection                   |
|---|-----------------------------|-------------------------------|------------------------------|
| 1   | Enclosure                   | PLASTIC                       | SCREW                        |
| 2   | AC power input/output ports | 100-240 Vac, 50-60 Hz , 10 VA | CONNECTOR                    |
| 3   | DC power input/output ports | NOT PRESENT                   | -----                        |
| 4   | Signals ports               | Serial 232 port               | Connector D-SUB 9 Pin male   |
| 5   | Telecomm. Ports             | CAN OPEN                      | Connector D-SUB 9 Pin Female |
| <p><i>Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.</i></p> |                             |                               |                              |

### 1.5 Auxiliary equipment

No auxiliary equipment

## **2. TEST CONDITIONS**

### **2.1 Operating test modes and test conditions**

The equipment has been tested according to the operative conditions described in the user/installation manual provided by the manufacturer and by following reference standards :

Reference Standard:

FCC Part 22, 24, 2

Measurements for frequency stability according to §2.1055

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item “Operating condition of the equipment under test” of all technical sheets of the tests (see Section 4)

| <b><i>Operating condition</i></b> | <b><i>Description</i></b>             |
|-----------------------------------|---------------------------------------|
| <b><i>#1</i></b>                  | <b><i>Continuous transmission</i></b> |

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### 3. Summary of test results

#### 3.1 Tests

| Name of test        | Paragraph | Result      |
|---------------------|-----------|-------------|
| frequency stability | 2.1055    | Test passed |

## 4. TEST RESULTS

|   |   |
|---|---|
| frequency stability (temperature) ..... | 8 |
| frequency stability (voltage) .....     | 9 |

**TEST  
1.****FREQUENCY STABILITY (TEMPERATURE)****Frequency Stability vs Temperature****REFERENCE  
DOCUMENT**

FCC 2.1055, 22.355

**1.1 Test procedure**

The equipment under test was connected to power supply and the RF output was connected to a test set. The EUT was placed inside the temperature chamber. The AC leads and RF output cable, exited the chamber through an opening made for that purpose.

After the temperature stabilized the frequency output was recorded from the test set.

**1.2 Test Result**PCS 1900

| Temp. (°C) | Frequency Error (Hz) | Frequency error (ppm) |
|------------|----------------------|-----------------------|
| 50         | 80                   | 0,0426                |
| 40         | 76                   | 0,0404                |
| 30         | 70                   | 0,0372                |
| 20         | 81                   | 0,0431                |
| 10         | 83                   | 0,0441                |
| 0          | 85                   | 0,0452                |
| -10        | 78                   | 0,0415                |
| -20        | 75                   | 0,0399                |

Note: operating range up to -20°C as declared by manufacturer



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**GSM 850**

| Temp. (°C) | Frequency Error (Hz) | Frequency error (ppm) |
|------------|----------------------|-----------------------|
| 50         | 48                   | 0,0574                |
| 40         | 44                   | 0,0526                |
| 30         | 39                   | 0,0467                |
| 20         | 37                   | 0,0443                |
| 10         | 35                   | 0,0419                |
| 0          | 33                   | 0,0395                |
| -10        | 36                   | 0,0431                |
| -20        | 40                   | 0,0478                |

Limit:  $\pm 2091$  Hz

Note: The measured frequency stability vs. temperature is identical (%difference) in all bands the above table since the Tx frequency is locked to the same TCXO.

**TEST****FREQUENCY STABILITY (VOLTAGE)**

## **2. Frequency Stability vs voltage**

### **REFERENCE DOCUMENT**

FCC 2.1055, 22.355

### 1.3 Test procedure

The equipment under test was connected to an variac power supply and the RF output was connected to a test set. The EUT was placed inside the temperature chamber. The AC leads and RF output cable, exited the chamber through an opening made for that purpose.

Vary primary supply voltage from 85 to 115 percent of the nominal value (120-230V). The output frequency was recorded for each power value. the frequency output was recorded from the test set.

### 1.4 Test Result

#### PCS 1900

| Voltage (V) | Frequency Error (Hz) | Frequency error (ppm) |
|-------------|----------------------|-----------------------|
| 195         | 44                   | 0,0234                |
| 230         | 40                   | 0,0213                |
| 265         | 42                   | 0,0223                |

#### GSM 850

| Voltage (V) | Frequency Error (Hz) | Frequency error (ppm) |
|-------------|----------------------|-----------------------|
| 195         | 38                   | 0,0455                |
| 230         | 30                   | 0,0359                |
| 265         | 32                   | 0,0383                |

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PCS 1900

| Voltage (V) | Frequency Error (Hz) | Frequency error (ppm) |
|-------------|----------------------|-----------------------|
| 102         | 40                   | 0,0213                |
| 120         | 37                   | 0,0197                |
| 138         | 41                   | 0,0218                |

GSM 850

| Voltage (V) | Frequency Error (Hz) | Frequency error (ppm) |
|-------------|----------------------|-----------------------|
| 102         | 32                   | 0,0383                |
| 120         | 28                   | 0,0335                |
| 138         | 30                   | 0,0359                |

**5. LIST OF EQUIPMENT USED**

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| Description                      | Manufacturer    | Model No.               |
|----------------------------------|-----------------|-------------------------|
| Climatic chamber                 | Mazzali         | Climatest               |
| Wireless communications test set | Agilent         | 8960 series 10 (E5515C) |
| Frequency counter                | Hewlett Packard | 5350B                   |
| Spectrum Analyzer                | Rohde & Schwarz | FSP ( 9kHz – 40 GHz)    |

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## 6 .PHOTOGRAPHIC DOCUMENTATION

### PHOTO N° 1 –EUT IDENTIFICATION

