ARTI

HHPC AND FMPC

THE AIRBORNE PARTICLES MONITORING TEAM

HHPC

MOBILE PARTICLE COUNTER FOR POINT-OF-USE MONITORING WITH INSTANT RESULTS

HHPC-6 THE „CLEANROOM-CONTROLLER“

HHPC-6 is the cost effective mobile solution for particle monitoring in cleanrooms, using a single counter for regular measurements of the cleanliness at many locations and trouble shooting particle contamination problems in cleanrooms.

It may also serve as a reference counter for stationary particle monitoring systems, investigating alarm situations or for integrity testing of cleanroom walls, clean benches and filter ceilings by scanning for leakage detection.

HHPC-6 displays 6 size channels from 0,3 to 5 µm, it reports the particle concentration as well as temperature and humidity and stores 500 sample records with date, time and sample location (label).

Typical Monitoring Applications for HHPC-6:

- Cleanrooms and clean benches in production- and laboratory areas
- Operation rooms or clean benches and isolation chambers in hospitals or pharmacies
- Monitoring in pharmaceutical and medical production or in filling and packaging areas of the food and beverage industry
- Air monitoring in computer rooms, in automobile paint shops or filter production

HHPC-2
THE „SMALL BROTHER“

HHPC-2 is a real particle counter used as a „concentration check“ for quick air cleanliness testing. It measures the particle concentration in 2 channels at > 0,3 and >0,5 µm and stores 100 samples. **HHPC-2** is ideal for house control in cleanroom areas, for indoor air quality testing or for filter and facilities maintenance.

Typical Applications for HHPC-2:

- Airborne particle monitoring in greyrooms and filter channels
- Filter diagnosis in cleanroom air supply
- Airborne particle monitoring in buildings, vehicles, aeroplanes etc.
- Airborne particle monitoring at work places

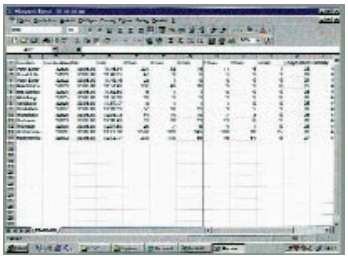
HHPC

Ergonomical Design

Through its ergonomic design, the light weight (1kg) and its weight distribution **HHPC-6** and **HHPC-2** can be handled comfortably and safely. For secured handling a wrist band is available. All sample data and measuring parameters are well organized and displayed by a large high resolution graphics LC Display and are accessible at one glance. The **HHPC-6** operates for over 6 hours continuously and is recharged in quick charge mode in less than 2 hours.

Leakage Test, Temperature- and Humidity Measurement

The **HHPC-6** has built-in sensors for temperature and relative humidity as standard feature. All sample data are stored internally. A removable isokinetic probe provides conformity with air sampling practices.



Flow Rate and Labels

The flow rate (2,83 L/min) is electronically regulated to achieve an accurate concentration reading. The sample time adjusts automatically to a selected sample volume.
With the download-utility names (labels) individual sample locations may be programmed. The sample data are then transferred under this name and clearly assigned to the locations of the monitoring plan.

Download-Utility and Printer

The sampled data may be transferred to a computer as tabular data and evaluated historically, statistically or with respect to the cleanliness class, using Excel® or similar programs. Download may also be done with Hyper-Terminal. Of course the data may also be printed with optional printers.

HHPC-2

The **HHPC-2** is mechanically and electronically equal to the **HHPC-6**. Its display however is simpler (only 2 channels) and the sample time is manually controlled. The display shows concentration (Particles/L or /CF).

FMPC

Small – only 10 x 5 x 5 cm

Critical clean areas such as filling areas are often difficult to access. The small size of the **FMPC** allows the installation even in such areas. Or the **FMPC** is mounted outside the area and the air is drawn from the sample location through a special tubing (antistatic). The **FMPC** is connected to the electrical and vacuum supply as well as the computer via 1 connection cable and 1 vacuum tubing and a wall plate.

FMS-Software

For process visualisation InTouch® is used, a commercial software which is configurable to custom requirements. The monitored hardware of the FMS-system then consists of **FMPC**'s, which are connected in series electrically, as well as other transducers for temperature, humidity, pressure, vacuum etc. RP-Monitor® is used when only particle counters are monitored.

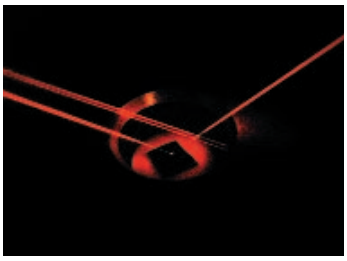
InTouch® and RP-Monitor® are brands by the companies Wonderware and RION.

JIS B 9921
Japanese Industry Standard

All ARTI particle counters fulfill the Japanese Industry Standard for airborne particle counters which sets the strongest demands to zero count rate, signal quality, resolution, counting efficiency and counting accuracy. Counters fulfilling this standard, even different models, are comparable and traceable to count standards and NIST size standards.

Long Life Laser

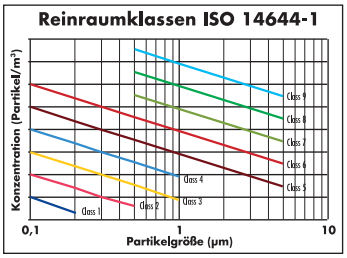
By using high quality diode Lasers which are not operated to their limits ARTI achieves a high operational life time of 36000 MTBF at 25° C.



Several Size Ranges

Der FMPC is available in two models:

- **FMPC 301** with 0,3 and 0,5 µm for critical cleanroom areas class 4 and 5 and larger according to ISO 14644-1 resp. classes A, B according to GMP.
- **FMPC 501** with 0,5 and 5 µm for controlled environments class 5 to 8 resp. classes B, C, D according to GMP in pharmaceutical production and health care.
- Custum calibration is available as option.

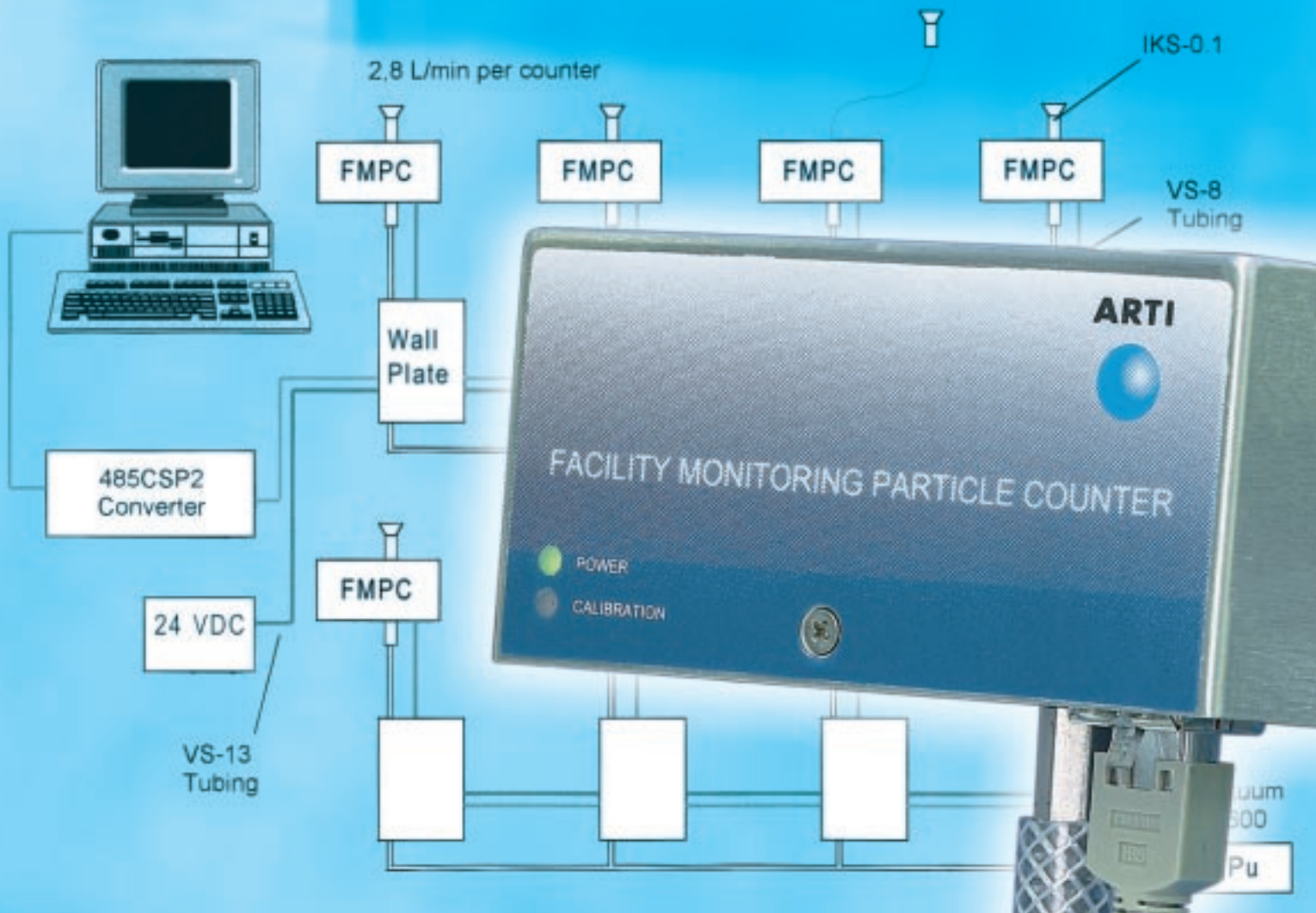


FMPC
STATIONARY PARTICLE COUNTER FOR CONTINUOUS MONITORING

The **FMPC** is designed to monitor cleanrooms continuously. It is mounted on the wall or a suitable holding plate near the machine or sampling point. Since the **FMPC** is light it can be mounted with velcro tape, which simplifies its removal before disinfection or for maintenance.
The small dimensions allow the installation directly in contamination sensitive working zones. For measurements in flow channels the **FMPC** is mounted externally and the air is drawn from the channel through a short sample tube.
The **FMPC** is connected to a vacuum source and power by wall plates which have a vacuum-, a power- and a data connector and integrate into the clean wall installation. The distance to the wall plate may be up to 7 m.

Typical application of the FMPC

- Cleanrooms and greyrooms
- Filling- or injection molding machines
- Filter element production
- Leak testing of filter ceilings with a cart
- Packaging- and filling areas
- Precision mounting areas
- Paint shop air supply
- Observatories



Technical Informations

	HHPC-6	HHPC-2
Size channels	0,3 µm; 0,5 µm; 0,7 µm; 1.0 µm; 2.0 µm; 5.0 µm	0,3 µm; 0,5 µm;
Relative Humidity	±5%, 20-90%, non-condensing	–
Temperature	±2°C, 10-40°C	–
Memory	500 Samples	100 Samples
Data transferred	Date, Time, Counts, Relative Humidity, Temperature, Sample volume, Alarm, Label	Date, Time, Counts, Sensor fault
Operation modes	CONCENTRATION, TOTALIZE, AUDIO	CONCENTRATION: Particles/L or /CF
Alarms	Counts, Battery empty, Sensor fault	Battery empty, Sensor fault
Display	Illuminated graphics-LCD	LCD with 4x16 characters
Delay-time	0-24 h	8 h
Interface	RS232C and RS485 via RJ-45	RS232C via RJ-45
Operating time continuous	5-6 h	8 h
Recharging time	2 h	2 h
Housing	Metalised plastic	Metalised plastic
Laser life time	>36000 h @ 25°C	>36000 h @ 25°C
Flow rate	2,83 L/min (0,1 CFM) regulated electronically	2,83 L/min (0,1 CFM) regulated electronically
Calibration	PS-Latex beads in air	PS-Latex beads in air
Counting efficiency	50% at 0,3 µm 100% at 0,45 µm	50% at 0,3 µm 100% at 0,45 µm
Coincidence loss	5% at 2.000.000 Particles/cft (70.000.000 Particles/m^3)	5% at 2.000.000 Particles/cft (70.000.000 Particles/m^3)
Dimensions (cm)	(WxHxD) 11,4 x 21 x 5,7	(WxHxD) 11,4 x 21 x 5,7
Weight	1 kg	1 kg
Charger	12 VDC at 2,5 A, 90-250 VAC, 50-60 Hz	12 VDC at 2,5 A, 90-250 VAC, 50-60 Hz
Battery	NiMH, 4,8 V at 4,5 Ah	NiMH, 4,8 V at 4,5 Ah
CE-Conformity	EMV; Low Voltage	EMV; Low Voltage

FMPC

2 Size channels	0,3 µm/0,5 µm (Standard); 0,5 µm/5.0 µm (Optional)
Environmental Temp./Humidity	10-40°C; 20-90%, non-condensing
Flow rate	2,83 L/min (0,1 CFM)
Vacuum source	Critical nozzle requires >60% Vacuum
Interface	RS232C and RS485 via RJ-45; Pulse Mode
Housing	Stainless steel
Laser life time	>36000 h @ 25°C
Calibration	PS-Latex beads in air
Counting efficiency	50% @ >0,3 µm; 100% @ >0,45 µm according to JIS B 9921
Coincidence loss	5% at 2.000.000 Particles/cft (70.000.000 Particles/m^3)
Dimensions (cm)	(WxHxD) 10,6 x 5,2 x 4,1
Weight	0,33 kg
CE-Conformity	EMC; Low Voltage

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