HORIBA
Semiconductor

# Differential Pressure Mass Flow Module

## D700WR Series

# Next Generation Mass Flow Module


## Contribute to Etching and Deposition Process at Atomic Level

Gas control in semiconductor manufacturing is one of the most important factors affecting process results. In recent years, as advanced semiconductor devices have evolved to finer and more three-dimensional structures, there has been an increasing demand for improved gas control performance that contributes to improved productivity and yield. HORIBA STEC has developed the D700 as the latest model in the Criterion series, aiming for further customer satisfaction through fluid measurement and control technology.

### Wide Range Control & High Accuracy

Control range:0.1-100 %F.S.Accuracy:±1 %S.P. (5-100 %F.S.)

### State Monitor Function

Provides more internal data to design smarter failure prediction system

### Fast Response

≤500 msec

### Improved Valve Shutoff

PFA Nozzle Equipped Valve Less than 0.05% F.S.

Please check the specifications for details.

STEC
Fluid Control
Technology

## Product Specifications

| Model | D707WR | |
|---|---|---|
| Gas *1 | Non-configurable | |
| Full scale *1 | Non-configurable | |
| Operating inlet pressure | 350-450 kPa (A) | |
| Operating differential pressure | ≥ 350 kPa (D) | |
| Operating downstream pressure | ≤ 13.3 kPa (A) | ≤ 53.3 kPa (A) |
| Control range | 0.1-100 %F.S. | 0.2-100 %F.S. |
| Flow rate accuracy at 25 °C | ±1 %S.P. (2.5-100 %F.S.)<br>±0.025 %F.S. (0.1-2.5 %F.S.) | ±1 %S.P. (5-100 %F.S.)<br>±0.05 %F.S. (0.2-5 %F.S.) |
| Temperature error from 25 °C | ±0.05 %S.P./°C (2.5-100 %F.S.)<br>±0.00125 %F.S./°C (0.1-2.5 %F.S.) | ±0.05 %S.P./°C (5-100 %F.S.)<br>±0.0025 %F.S./°C (0.2-5 %F.S.) |
| Offset/Span stability at 25 °C *2 | ±0.5 %F.S./year | |
| Repeatability *3 | ±0.3 %S.P. (2.5-100 %F.S.)<br>±0.0075 %F.S. (0.1-2.5 %F.S.) | ±0.3 %S.P. (5-100 %F.S.)<br>±0.015 %F.S. (0.2-5 %F.S.) |
| Valve type | Normally closed/Piezo actuator | |
| Settling time for step up *4 | ≤ 500 msec | |
| Settling time for step down *4 | ≤ 3 msec | |
| Overshoot | ±2 %S.P. or ±0.5 %F.S. whichever is larger | |
| Undershoot | ±2 %S.P. or ±0.5 %F.S. whichever is larger | |
| Inlet pressure influence performance *5 | ±1 %S.P. (2.5-100 %F.S.)<br>±0.05 %F.S. (0.1-2.5 %F.S.) | ±1 %S.P. (5-100 %F.S.)<br>±0.1 %F.S. (0.2-5 %F.S.) |
| Valve sheet leak *6 | (TYP.)< ±0.025 %F.S. < ±0.05 %F.S. | |
| Proof pressure | 1000 kPa (A) | |
| Design pressure | < 1000 kPa (G) | |
| Leak integrity | ≤ $5 \times 10^{-12}$ Pa•m³/s (He) | |
| Wetted material *7 *8 | SUS316L, Ni-alloy, PFA, PCTFE | |
| Operating temperature | 15-45 °C | |
| Storage temperature | 0-80 °C | |
| Installation orientation *9 | Attitude insensitive | |
| Inlet pressure accuracy | ±10 kPa (0-1000 kPa (A)) | |
| Temperature accuracy | ±1 °C (15-45 °C) | |
| Warming up operation | ≥ 30 minutes | |
| Control interface *10 | RJ45 connector, EtherCAT® protocol | |
| Power supply | M8 5 pin male connector, 24 VDC±4V, Instantaneous peak 9.6 W/Normal dissipation 7.0 W | |

*1 Please contact us for supported kinds of gas and flow rates.
*2 This is guaranteed value under 25 °C and ≤ $1.0 \times 10^{-3}$ Pa (A).
*3 Output noise is include in Repeatability.
*4 Setting time is MFC output signal and $N_2$ gas at 25 °C. Other detail definition follows setting time of "SEMI Standard E17-1011 section 4.1.4".
*5 Pressure perturbation has to be smaller than 20 % pressure change per second and ±70 kPa/sec. (10 PSI/sec).
*6 The "(TYP.)" value is a representative ability value at the time of in-house verification.
*7 PFA means Poly[tetrafluoroethylene-co-perfluoro (alkyl vinyl ether)].
*8 PCTFE means Polychlorotrifluoroethylene.
*9 After installation, be sure to perform zero point adjustment refer to "D707WR Zero Adjustment Procedure".
*10 EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH in Germany.

**IMS**

The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001.
We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.

RoHS COMPLIANT

**Applying to the EU RoHS Directive : This products is compliant with the restriction of the designated 10 hazardous substances(*).**
(*) lead , cadmium , mercury , hexavalent chromium , polybrominated biphenyls (PBB) , polybrominated diphenyl ethers (PBDE) , bis (2-ethylhexyl) phthalate (DEHP) , butyl benzyl phthalate (BBP) , dibutyl phthalate (DBP) and diisobutyl phthalate (DIBP)
**Using lead-free soldering : Lead-free soldering is used for mounting components of printed circuit boards.**
- Many countries consider the reinforcement of regulations concerning the risk caused by lead to human body and the environment




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**Please read the operation manual before using this product to ensure safe and proper handling of the product.**

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