



ARV-2000™

for Tracks

Hardware

Dynamic, Dependable Pressure Control

Brooks Automation's ARV 2000™, exhaust flow controller for all Track equipment. The ARV 2000 uses single stage regulation to control and maintain constant pressure in semiconductor processes by compensating for fluctuating exhaust, while reducing the potential for contamination. The unique design of this exhaust control valve, combined with an Adaptive™ software control strategy, provides rapid, precise "Fast Set Point" control.

Innovative Technology

The ARV 2000 valve consists of a paired set of rotating vanes positioned by a stepper motor. The radial design of the ARV 2000 produces a linear response to air flow with each step of the motor (Direct Drive "Zero" Backlash) providing uniform control from Low to very High flow ranges. The unique stealthy aerodynamic shape of the vanes minimizes resistance across the valve, allowing the process full utilization of the available house exhaust. The simple, self-cleaning, robust design offers long term reliability and minimizes maintenance requirements.

An Improvement over Traditional Control

The linearity of the ARV 2000, throughout its entire operating range is significantly differentiated from traditional control valves. The unique radial vane configuration of the ARV 2000 provides maximum control at both ends of its operational range. This is in marked contrast to a butterfly valve, auto damper or double acting gate valve which all exhibit both accuracy at the top end and decreased capability with respect to the valves' orientation and facility duct design.

Additionally, the ARV 2000 incorporates Brooks' unique adaptive software "Fast Set Point" control technology, providing rapid response to set point changes unachievable with conventional PID control techniques.



ARV-2000 "Aerodynamic Resistor Value"

FEATURES:

- > Linear response across a full Low to very High operating range
- > Adaptive "Fast Set Point"™ (FSP) software
- > Multi-Set Point Control
- > Low resistance stealth aerodynamic flow path
- > Electronically interchangeable with all other Brooks' control products.
- > RS 422/485 and Analog Communications
- > Direct Drive, Zero Backlash

BENEFITS:

- > Easy Snap-In & Snap-Out Installation
- > Ultra Compact
- > Universal orientation
- > Chemically compatible with all track process
- > Improved process uniformity
- > Rapid response to set point changes
- > Adaptable and upgradeable

Fast Set Point Control

Adaptive, fast set point software of the microprocessor based TIM-100 FSP speeds the ARV 2000 to set point. The TIM software incorporates a table of up to four set points. Whenever the ARV 2000 changes set point, the TIM-100 FSP recalls the last stepper motor position from the table and commands the ARV 2000 directly to the required position. A PID loop fine tunes the system and maintains set point. Each repetition of a particular set point command results in a "learned" position, continuously improving accuracy. The sophisticated electronics, coupled with the fast set point software of the TIM-100 FSP, make it a truly adaptive controller.

Host Communications

In addition to stand alone, closed-loop control, the TIM can work with an upstream host. The TIM has a 0-5 V analog interface for remote set point control from the process tool. An RS422/485 serial communications port is available for use by the process tool or the facility integrated control system.

System Compatibility

ARV 2000 system electronics, with minimal configuration changes entered from the TIM keypad, can be used to control Progressive Technologies automated VRV and automated Sentry products. Pressure control technology can be upgraded to "fast set point" control at any time with minimal expense and effort.

ARV 2000 Specifications

Control Method:	Fast Set Point Technology
Exhaust Range:	0.7 - 3.9 in H ₂ O (175-970 Pa)
Operating Range:	- 0.03 to -1.9 in H ₂ O (-7 to -470 Pa)
Process Flow Range:	5-104 CFM (0.14-2.94 m ³ /min)
Set Point Accuracy: (typical)	Greater of ± 0.02 in H ₂ O (± 5 Pa) or $\pm 5\%$ set point
Set Point Accuracy: ($\pm 20\%$ H.E. fluctuation)	Greater of ± 0.025 in H ₂ O ($+6.9$ Pa) or $+ 5\%$ set point
Response to Set Point Change:	<0.5 seconds
Response to H.E. Fluctuation:	<0.5 seconds
Response from Open to Closed:	< 1 .5 seconds
Chemical Compatibility:	Low concentration of solvents, acids, and bases
Operating Modes:	
Remote Analog	0-5 Volts
Remote Digital Serial	RS 422/485
Stand Alone	1-4 set points
Power Requirements:	Brooks universal power supply (User supplied)
AC	90-260 VAC, 47-63 Hz
DC	+15 to +24 VDC, 650 mA -15 to -24 VDC, 50 mA
Nominal System Power:	12W
Alarms:	Deviation, high, and low alarms
Mounting:	Any orientation
MTBF:	500,000 full cycles
MTTR:	<5 minutes
Weight:	3 lb(1.4 Kg)
Dimensions:	4.9 in L x 5.0 in W x 8.8 in H (125mm Lx 127mm W x 223 mm H)
Input:	4 in (102 mm)
Output:	4 in (102 mm)



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