

Reversible Bias Supply with Floating Detector Supply RD005, RD010

- TOF mass spectrometers, floating detectors
- $\pm 5\text{kV}$, $\pm 10\text{kV}$
- Fast reversing, slewing & settling
- Differential control inputs
- High stability - temp-co $<25\text{ppm}/^\circ\text{C}$
- Flashover & short circuit protected
- Detector has ground referenced power, control & feedback



The RD range is a unique family of reversible polarity power supplies, directly coupled internally within the unit to a variable 3kV floating detector supply. The reversible section features fast settling times together with low ripple, tight temperature co-efficient, and very low drift. They include differential control inputs, for compensating for voltage drops on 24V supply return connections and eliminating the effects of earth loops. The detector section with ground referenced power, control and feedback, retains excellent stability even during polarity reversal of the bias supply.

Electrical Specification: RD Series

Unit Type	Bias Output	Bias O/P Current	Size (mm)	Weight (kg)	Bias Ripple at Full Load	Floating Detector	Floating Detector Ripple
RD005RIP025	-5kV to +5kV	250 μA	240 x 216 x 57	4.0	$<150\text{mVp-p}$	3kV @400 μA	$<200\text{mVp-p}$
RD010RIP025 *1)	-10 kV to +10 kV	125 μA	240 x 216 x 57	4.0	$<200\text{mVp-p}$	3kV @400 μA	$<200\text{mVp-p}$

*1) Available for volume applications only.

Electrical Specification

Input	+24V dc $\pm 10\%$ $<1\text{A}$. 0V input common to HV return and chassis.	
Control of Bias output	0V to +10V for 0% to $\pm 100\% \pm 2\%$	$Z_{in} = 200\text{k}\Omega$
Voltage monitor	-10V to +10V $\pm 2\%$ for -100% to +100%	$Z_{out} = 10\text{k}\Omega$
Polarity control	Negative: $<2.0\text{V}$ Positive: $>2.5\text{V}$ or open circuit	
Polarity change-over time	$<500\text{ms}$	
Inhibit (detector & bias)	Output off: $<1.2\text{V}$ or open circuit Output on: $>3.6\text{V}$	
Precision current monitor	-10V to +10V $\pm 2\%$ for -100% to +100%. Offset $\pm 0.1\%$ of FS	$Z_{out} = 10\text{k}\Omega$
Output temperature co-efficient	Bias $<25\text{ppm}/^\circ\text{C}$	Detector $<300\text{ppm}/^\circ\text{C}$
Drift (after 1 hour warm up)	$<0.01\%$ per hour, $<0.05\%$ over an 8 hour period	
Line regulation	Bias $<100\text{ppm}$ for 1V change in input voltage	Detector $<0.1\%$
Load regulation	Bias $<100\text{ppm}$ for 100 μA to maximum load	Detector $<0.1\%$

File code: LS_DS_RD-Series_en/09/24

RD Series

Mechanical Specification

Mountings	6 off M4 Clearance holes—see outline drawing
Input & Control	Berg 20-way IDC header Part No 65863-069 for use with ribbon cable
Outputs	By 0.5m screened (shielded) lead type URM43 Bias Output is internally connected to Detector –ve

Environmental Specification

Temperature, operating:	+10°C to +50°C	Humidity (RH) <30°C non-condensing:	80% maximum
Temperature, storage:	–35°C to +85°C	Humidity (RH) >30°C non-condensing:	Decrease linearly to 50% at 40°C
Altitude, operating:	Up to 2,000m	Altitude, storage:	Up to 18,000m

The unit is to be supplied from a current limited supply providing 24V dc, impulse limited to overvoltage Category I (of IEC60364-4-443).
For use in an environment of pollution degree 2.

Pin Assignments

1	+24V dc input *2)	11	Signal ground
2	nc	12	Detector voltage control +i/p *3)
3	+24V dc input *2)	13	Supply 0V *2)
4	Bias voltage monitor o/p	14	Detector voltage control –i/p *3)
5	+24V dc input *2)	15	Supply 0V *2)
6	Current monitor o/p	16	Detector voltage monitor o/p
7	+24V dc input *2)	17	Supply 0V
8	Bias voltage control +i/p *3)	18	Bias Polarity Select i/p, L=<0.5=–ve, H or OC=+ve
9	+24V dc input *2)	19	Supply 0V *2)
10	Bias voltage control –i/p *3)	20	Inhibit L=OC=<1.0V=OFF, H=>10V=On (both supplies)

Notes:

*2) The input connector pins are not rated at the full input current of the power supply. Use at least 2 pins in parallel for the +24V power supply input & the power ground.

*3) Control input is fully differential, but –0.6V > Control Return >+0.6V
–10.25V < Vpin8 - Vpin10 < 10.25V –0.25V < Vpin12-Vpin14 < 10.25V

Part Number Selection

Series Code: RD

o/p kV	Polarity	Options Code	Temp Co
005 = 5.0kV	R	IP= no options available	25
010=10kV			

Example: RD010RIP025 = 10kV version

Dimensions

Dimensions in mm
Projection/first angle

