HRF15 series

15W

DC-HVDC converter

The HRF15 series of 15W precision high voltage DC-DC converters provide fully adjustable output voltages up to 15kV, with built-in short-circuit and overload protection. HRF15's precise load and line regulation, stability, and low ripple ensure reliable and accurate power delivery for critical, noise-sensitive applications.

In addition to standard analog monitoring and control, the HRF15 is also available in a digital version with both output voltage and current programming through PMBus via I²C. The digital interface simplifies system integration through an intuitive UI and improves reliability with advanced monitoring features, including status flags, multi-unit operation, and statistical data logging.

HRF15 features voltage and current monitoring and 0 to 100% voltage control for increased safety, flexibility, and enhanced efficiency. Its advanced functionality, technical specifications, and safety approvals allow easy integration into a wide range of high voltage applications in analytical instruments and semiconductor wafer inspection equipment.

Features

▸ Output voltages up to 15kV

▸ Output ripple as low as 0.001%

▸ Stability as low as 10ppm/hr, 25ppm/8hrs

▸ Temperature coefficient of 25ppm/°C

▸ +24VDC input voltage

▸ Output voltage and current regulated

▸ 0 to 100% programmable output voltage and current

▸ Voltage and current control and monitoring

▸ Digital communication via PMBus

▸ Arc, short circuit and overload protections

▸ Intuitive UI for easy configuration

▸ Black Box reporting

▸ UL61010 and 62368 approved

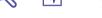▸ Operating temperature: 0°C to +50°C (ambient)

▸ 3 year warranty

Applications

▸ Scanning electron microscopy

▸ E-beam/ion beam

▸ Mass spectrometry

▸ Electrophoresis

▸ Capacitor charging

▸ High voltage bias

▸ Photo multiplier tube

Dimensions

162.6 x 72.4 x 33 mm (6.40" x 2.85" x 1.30")

Documentation

For further information click the link or scan the code

→ **xppower.com**

Models & ratings

Analog

Model[1]	Output voltage	Model[1]	Output voltage	Output current
HRF1524S10K0P	0 to +10kV	HRF1524S10K0N	0 to -10kV	1.5mA
HRF1524S12K0P	0 to +12kV	HRF1524S12K0N	0 to -12kV	1.25mA
HRF1524S15K0P	0 to +15kV	HRF1524S15K0N	0 to -15kV	1mA

Notes:
1. Other voltages available upon request.

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Models & ratings

Digital

Model[1]	Output voltage	Model[1]	Output voltage	Output current
HRF1524S10K0P-D	0 to +10kV	HRF1524S10K0N-D	0 to -10kV	1.5mA
HRF1524S12K0P-D	0 to +12kV	HRF1524S12K0N-D	0 to -12kV	1.25mA
HRF1524S15K0P-D	0 to +15kV	HRF1524S15K0N-D	0 to -15kV	1mA

Notes:

1. Other voltages available upon request.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	21.6	24	26.4	VDC	24VDC nominal
Input current			1	A	See models & ratings table
Input undervoltage lockout	OFF/Shutdown @ <20.5VDC, ON/Restart @ >21.5VDC				
Input overvoltage protection	OFF/Shutdown @ >28VDC, ON/Restart @ <27.5VDC				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage			15000	VDC	See models & ratings table
Output current			1.5	mA	See models & ratings table
Output programming	0		100	%	Output voltage/current is programmable via Analog DC Voltage Programming Input (Vpgm)
Initial set point accuracy		±1		%	At maximum Vpgm, no load
Linearity: output vs. program			1	%	10 to 100% output
Minimum load	No minimum load required				
Start up response	See application notes				
Line regulation			0.001	%	100% Vpgm, full load, (min to max input)
Load regulation			0.001	%	100% Vpgm, 24VDCin, (no load to full load)
Transient response	Overshoot <5%, (For 50% - 100% - 50% load change).				
Ripple and noise			0.001	%	1MHz bandwidth, see models & ratings table
Temperature coefficient		25		ppm/°C	Applicable to analog programming mode
Stability		10		ppm/1hr	After 1 hour warm up
		25		ppm/8hrs	After 1 hour warm up
Short circuit, overload	Rectangular V/I characteristics				
Overtemperature protection		+55		°C	Shutdown @ +55°C typical, ±5% at the hot spot

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General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	65			%	Max Vpgm, full load
Isolation: input to output	N/A - input ground is internally connected to output ground				
Construction	Aluminium chassis and cover				
Switching frequencies		60		kHz	
Mean time between failure	TBD			Mhrs	MIL-HDBK-217F, +25°C GB
Weight		465 (1.03)		g (lb)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	0		+50	°C	
Storage temperature	-40		+85	°C	
Cooling	Natural convection				
Humidity			95	%RH	Non-condensing

Safety approvals

Certification	Standard	Notes & conditions
UL	IEC/UL/CSA/EN 61010, 62368	61010 pending
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Signals

Characteristic	Pin	Function	Description
IMON	1	Output: current monitor	0V to +10VDC output measures 0 to 100% Iout, 1% accuracy of full scale
UVP	2	Output: Undervoltage protection monitor	Signal low = Fault
OTP	3	Output: Overtemperature protection monitor	Signal low = Fault
VPGM[3]	4	Input: voltage programming	0V to +10VDC signal programs Vout from 0 to 100%, Z=100kΩ
REF	5	Output: voltage reference	+10VDC, ±0.5% - current <10mA
VMON	6	Output: voltage monitor	0V to +10VDC output measures 0 to 100% Vout, 1% accuracy of full scale
VIN	7	Input: 24VIN	+24VDC, 1A maximum
PGND	8	Input ground	Power ground
AGND	9	Analog ground	Analog ground for control and monitoring
I2C SCL	10	Serial Clock wrt Pin 8	No Connect for analog version
I2C SDA	11	Serial Data wrt Pin 8	No Connect for analog version
DISABLE	12	Input: remote disable	Open or No Connect turns unit ON. Ground connection turns unit OFF
IPGM[3]	13	Input: current programming	0VDC to +10VDC signal programs Iout from 0 to 100%, Z=100Ω[1]
N/C	14	N/A	
OVP	15	Input: Overvoltage protection monitor	Signal low = Fault

Notes:
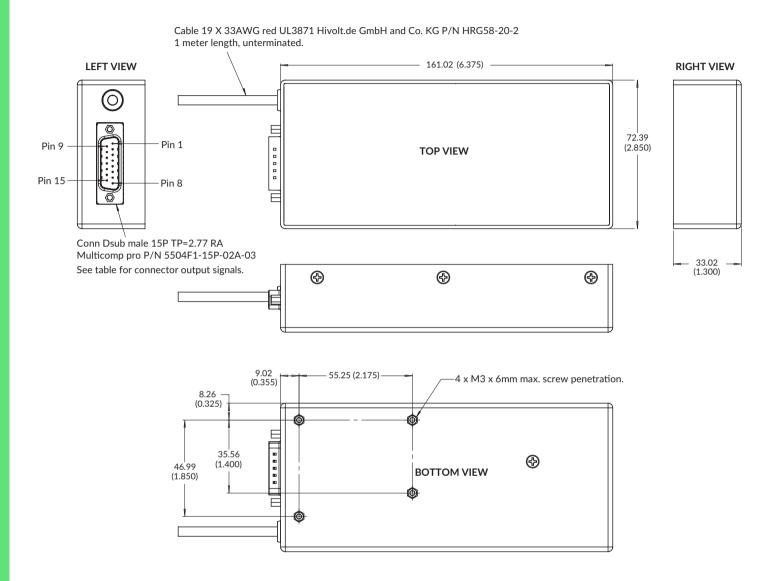
1. 0 to +10VDC, preset current limit 105%.
2. Digital communication available upon request.
3. No Connect for digital models.

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Mechanical details

Cable 19 X 33AWG red UL3871 Hivolt.de GmbH and Co. KG P/N HRG58-20-2
1 meter length, unterminated.

LEFT VIEW

Pin 9
Pin 1
Pin 15
Pin 8

Conn Dsub male 15P TP=2.77 RA
Multicomp pro P/N 5504F1-15P-02A-03
See table for connector output signals.

161.02 (6.375)

TOP VIEW

72.39 (2.850)

RIGHT VIEW

33.02 (1.300)

9.02 (0.355)
55.25 (2.175)
4 x M3 x 6mm max. screw penetration.

8.26 (0.325)

35.56 (1.400)

46.99 (1.850)

BOTTOM VIEW

Notes:

1. Dimensions are in mm (inches).
2. Weight: 465g (1.03lb) approx.