ATE System DC Power Supplies
HMR Series

LAN | USB | GPIB (optional) | Analog (optional)

The HMR Series 10 kW / 18 kW multi-range DC power supplies provide dependable performance for ATE applications requiring a wide output voltage and current in a compact 3U form factor. Unlike conventional fixed-range power supplies, multi-range (autoranging) operation enables the HMR Series to deliver maximum power at multiple voltage / current combinations. Integrators will benefit from fast command response times and low noise characteristics. Additionally, the wide AC input range simplifies installation.

The large touchscreen display combined with dedicated rotary knobs and output on/off button offer intuitive front panel control. The HMR Series also supports USB and LXI compliant LAN interfaces for remote PC control and programming. Optional GPIB and analog interface modules are user-installable. PC software is provided for test sequence generation and data logging without the need to write source code. The built-in web server enables remote instrument control from a web browser.

The HMR Series incorporates SiC MOSFETs, which deliver lower on-resistance, reduced switching losses, and superior thermal performance compared to traditional silicon (Si) FETs. This advanced design results in higher overall performance, improved efficiency, and increased reliability.

System Integration

The HMR Series offers many features for ATE system and integration applications.

Automation:

- LXI simplifies integration and system development
- Fast command response time (3 ms)
- LabVIEW™, IVI-C, and IVI.NET drivers included
- List mode programming
- Built-in web server

Integration:

- 3U form factor saves rack space
- Convenient 200 to 415 VAC input
- Parallel operation
- Comprehensive protection features for the power supply and DUT
- Optional user-installable GPIB and Analog interfaces
- Thermostatically controlled cooling fans reduce acoustic noise while keeping system temperatures low

Features and benefits

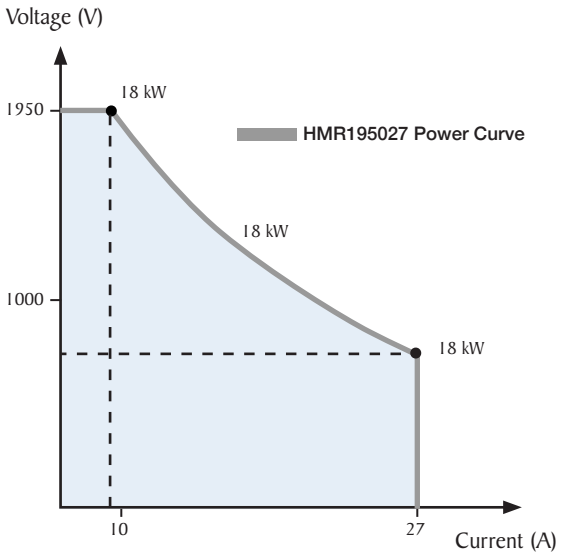
- Output up to 1950 V or 360 A
- Multi-range operation, capable of replacing multiple fixed range power supplies
- Compact 3U form factor
- 10 kW and 18 kW models available
- Master/Slave mode operation provides up to 1.8 MW with 100 units connected in parallel
- Configurable internal resistance to simulate the output of a battery
- Overvoltage (OVP), overcurrent (OCP), overpower (OPP), overtemperature (OTP) protection, and key-lock
- Adjustable voltage and current slope (rise and fall time)
- Save/recall up to 16 list mode programs with up to 500 steps each
- Output on timer
- Remote sense to compensate for voltage drop
- Efficiency up to 95%
- Standard LAN (LXI-compliant) and USB interfaces
- User installable GPIB and analog interfaces optional
- Soft panel software for remote control and data logging included
- Wide range AC input support simplifies instrument set up and integration

Model	HMR80360	HMR65046	HMR130023	HMR500108	HMR195027
Max. Output Voltage	80 V	650 V	1300 V	500 V	1950 V
Max. Output Current	360 A	46 A	23 A	108 A	27 A
Max. Output Power	10 kW			18 kW	

Operation highlights

Multi-range Operation

Conventional power supplies with rectangular output characteristics only provide maximum output power at one voltage/current point. Multi-range functionality of the HMR Series expands the maximum power output from one point to a curve illustrated in the figure below. This flexibility enables multi-range power supplies to replace multiple fixed range power supplies, reducing equipment requirements and simplifying test setups.



List Mode

List mode (sequence mode) allows users to output a sequence of up to 500 programmed steps. Each step setting includes voltage, current, power, and time. List mode sequences can be programmed remotely using SCPI commands, with the included application software, or by importing a spreadsheet file through the front panel USB port.

Configurable Internal Resistance

The adjustable internal resistance setting enables the HMR Series to simulate the output of a battery. This provides more realistic and repeatable testing of battery-powered DUTs.

Precise Output Control

Output on/off ramp time

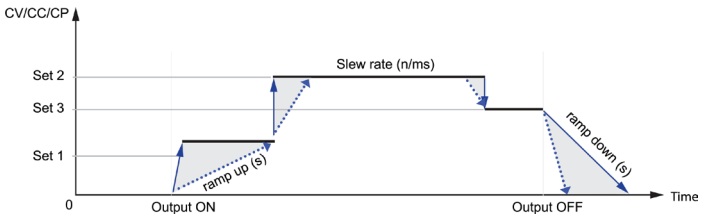
Control the time it takes for the output to reach the set power when the output is enabled as well as how quickly the output returns to zero when the output is disabled. The ramp up and ramp down times can be set from 0.001s to 99.999s.

Output timer

The timer-controlled output can be set from 0.1s to 99999.9s.

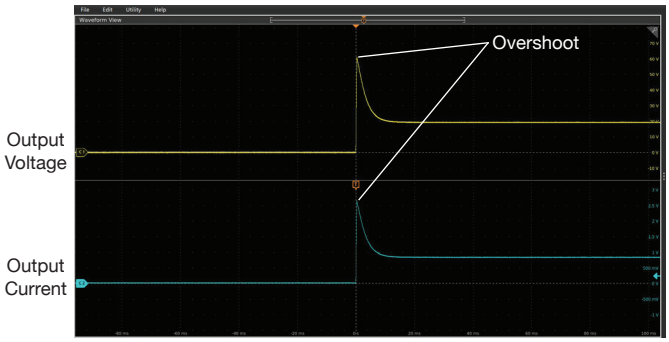
Adjustable slew rate

Slew rate setting allows users to control the voltage and current slope (rise and fall times).

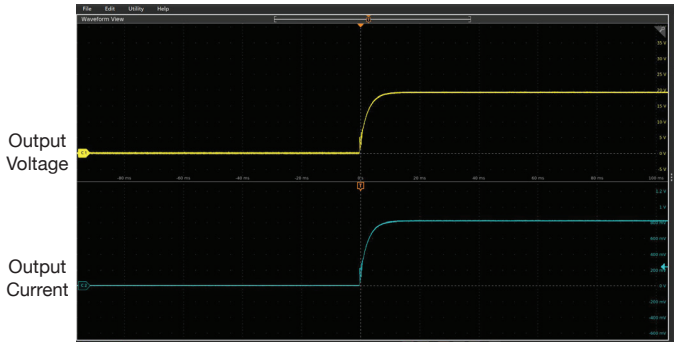


Regulation priority

Most conventional DC power supplies automatically transition between CV, CC, and CP operating modes depending on the load resistance and the power supply's voltage/current level settings. Side effects of automatically transitioning between operating modes are the potential for voltage or current overshoot or undershoot caused by rapidly changing load conditions. The HMR Series' regulation priority setting optimizes power supply behavior in order to minimize overshoot and undershoot. The measurements below show the how overshoot is reduced during a diode validation test when the regulation priority is set to CV.



CC Priority



CV Priority

The tools you need

Device Protection

To protect your power supply and DUT, the HMR Series provides overvoltage (OVP), overcurrent (OCP), overpower (OPP), and overtemperature (OTP) protection. A fault will trigger an alarm and disable the output. The interlock function can be used to enable or disable the power supply from an external switch or relay. The included output protection cover and AC input protection assembly provide an added layer of safety and protection.

When working with motors, transformers, or other inductive loads, the optional protection unit safeguards your HMR Series power supply from reverse voltage and inductive kickback. The protection unit architecture consists of a blocking diode and free-wheeling diode (Figure 1) capable of protecting multiple HMR Series power supplies connected in parallel.

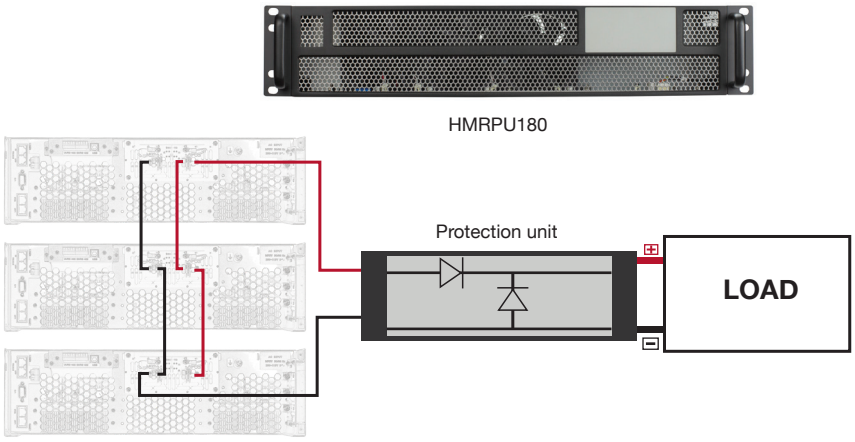


Figure 1

Master/Slave Operation

For more power, models with the same rating can be connected in parallel and operate in master/slave mode. The RJ45 ports are used for communication between the master and slave(s). Up to 100 units can be connected in parallel to provide 1.8 MW of power.

Analog Programming and Monitoring

The optional isolated analog interface (HMRALG) can be used to monitor and control voltage, current, and regulation mode (CV, CC, CP, CR). In addition to front panel and PC interface control, the HMR Series can be controlled from zero to full scale by an external voltage signal (0 to 5 V or 0 to 10 V selectable). This option is user-installable and swappable.

Web Server Interface

The HMR Series provides a built-in web server that allows users to configure, control, and monitor the basic settings of the power supply, using a web browser on a computer connected to the same local area network.

Application software

PC software is provided for generating and executing test sequences or logging measurement data without the need to write source code.

- Log voltage, current, and power values with time stamp
- Configure and run list mode programs
- Control and monitor multiple power supplies remotely in master/slave mode

Front panel

Unique output on/off safeguard button

The output is enabled by pressing directly on the center of the button, helping to prevent accidental activation from bumping the button

The output can be quickly and easily disabled with a light tap anywhere on the edge of the button

Enable output

Disable output

USB host port
Save/recall instrument settings, import list mode programs

Bright 5-inch touchscreen display
Displays both measured output values and the set parameters simultaneously

Dedicated Voltage & Current control
Precisely increment and decrement input values

Quick recall presets
Three quick access presets to recall instrument settings for different applications

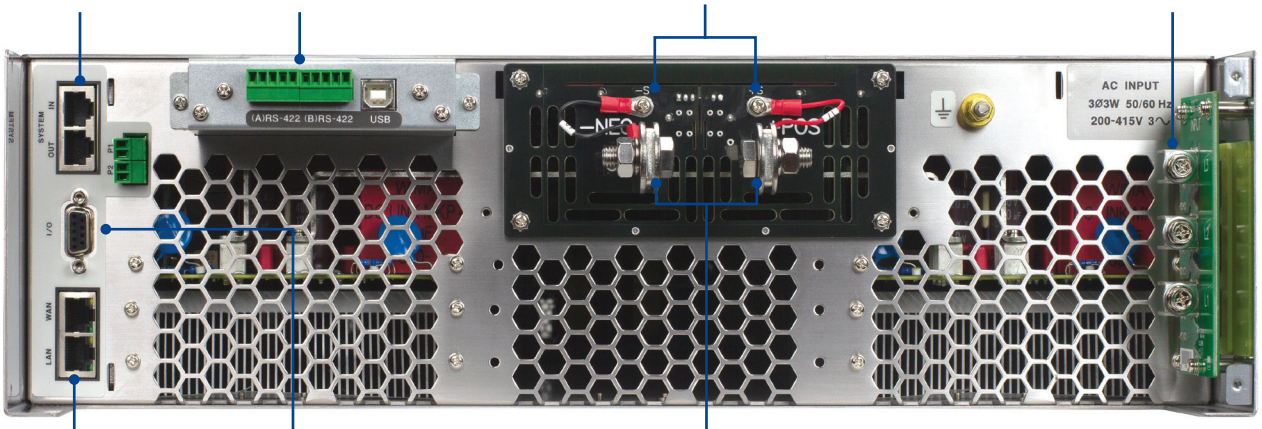
Rear panel

Master/Slave communication ports
Connect up to 100 power supplies for more power

Swappable interface module
Easily swap the included USB interface module for optional GPIB or analog interfaces

Remote sense
Compensates for voltage drops due to test leads

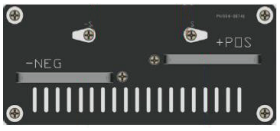
AC input terminals
Wide range AC input supports 200 to 415 VAC



WAN & LAN interfaces
The WAN port eliminates the need for an external hub when using two or more units in parallel

Digital I/O
Interlock, external output on/off, alarm signal output

Robust output terminals
Large bus bar output terminals simplify DUT connections. The removable output terminal cover provides an added layer of safety



Output terminal orientation of model HMR80360 only

Specifications

Note: All specifications apply to the unit after a temperature stabilization time of 30 minutes over an ambient temperature range of 23 °C ± 5 °C. Specifications are valid for single unit operation only. Under 80% humidity.

Model		HMR80360	HMR65046	HMR130023	HMR500108	HMR195027
Output Rating						
Output Voltage		0 to 80 V	0 to 650 V	0 to 1300 V	0 to 500 V	0 to 1950 V
Output Current		0 to 360 A	0 to 46 A	0 to 23 A	0 to 108 A	0 to 27 A
Output Power		10 kW			18 kW	
Line Regulation						
Voltage		16 mV	130 mV	260 mV	100 mV	390 mV
Current		180 mA	23 mA	11.5 mA	54 mA	13.5 mA
Load Regulation						
Voltage		40 mV	325 mV	650 mV	250 mV	975 mV
Current		540 mA	69 mA	34.5 mA	162 mA	40.5 mA
Ripple and Noise (20 Hz to 20 MHz)						
Voltage p-p		288 mV	720 mV	1800 mV	375 mV	3360 mV
Voltage rms [1]		23 mV	180 mV	395 mV	75 mV	645 mV
Current rms		144 mA	29 mA	20 mA	54 mA	42 mA
Resolution						
Programming		1 mV / 10 mA	10 mV / 1 mA	100 mV / 1 mA	10 mV / 10 mA	100 mV / 1 mA
Readback		1 mV / 10 mA	10 mV / 1 mA	100 mV / 1 mA	10 mV / 10 mA	100 mV / 1 mA
Programming Accuracy						
Voltage		80 mV	650 mV	1.3 V	500 mV	1.95 V
Current		720 mA	92 mA	46 mA	216 mA	54 mA
Readback Accuracy						
Voltage		80 mV	650 mV	1.3 V	500 mV	1.95 V
Current		720 mA	92 mA	46 mA	216 mA	54 mA
Output Response Time [2]						
Rise Time	Full Load	< 30 ms				
Fall Time	Full Load	< 80 ms				
	No Load	< 5 s	< 6 s	< 6 s	< 5 s	< 6 s
Protection						
OVP Range		0 to 88 V	0 to 715 V	0 to 1430 V	0 to 550 V	0 to 2145 V
OCP Range		0 to 396 A	0 to 50.6 A	0 to 25.3 A	0 to 118.8 A	0 to 29.7 A
Internal Resistance						
Adjustment Range		0 to 0.2222 Ω	0 to 14.13 Ω	0 to 56.5217 Ω	0 to 4.6296 Ω	0 to 72.222 Ω
Resolution		0.1 mΩ	1 mΩ		0.1 mΩ	1 mΩ
Accuracy		< 2.3% of maximum settable resistance				

(1) Measurement bandwidth up to 300 kHz.
(2) From 10% to 90% or from 90% to 10% of total voltage excursion.

General

Model		HMR80360	HMR65046	HMR130023	HMR500108	HMR195027
General						
Remote Sense Compensation		5 V				
Transient Response Time [3]		< 1.5 ms				
Command Response Time [4]		3 ms				
Efficiency [5]		93%	95%	94%	93%	95%
I/O Interfaces		LAN (LXI-compliant 1.4)				
AC Line Input	Nominal	200 to 415 VAC, 50 Hz/60 Hz				
	Operating	180 to 460 VAC, 47 Hz to 63 Hz				
AC Line Phase		3-phase				
Maximum Rated Input Power		12 kVA			21.6 kVA	
Input Current		40 A/phase				
Inrush Current		66 A/phase			99 A/phase	
Power Factor (typical)		0.95 (200 - 415 V input)			0.95 (380 - 415 V input)	
Temperature Ratings	Operation	32 °F to 122 °F (0 °C to 50 °C)				
	Storage	-4 °F to 158 °F (-20 °C to 70 °C)				
Temperature Coefficient	Voltage	8 mV / ºC	65 mV / ºC	130 mV / ºC	50 mV / ºC	195 mV / ºC
	Current	36 mA / ºC	4.6 mA / ºC	2.3 mA / ºC	10.8 mA / ºC	2.7 mA / ºC
Weight		80.1 lbs (36.3 kg)	76.8 lbs (34.8 kg)		96.2 lbs (43.6 kg)	
Warranty		3 Years				
Dimensions (W x H x D)		17.3" x 5.2" x 26" (440 x 132 x 660 mm)				
Standard Accessories		Certificate of calibration, output protection cover, AC input cover assembly, and Ethernet cable				
Optional Accessories		GPIB Interface Card (HMRGPIB), Isolated Analog Interface Card (HMRALG), Parallel Bus Bars (HMRPB), Protection Unit (see protection unit details in ordering information section)				

Regulatory Compliance	
Safety	Low Voltage Directive (LVD) 2014/35/EU, EN61010-1:2010, +A1:2019
Electromagnetic Compatibility	EMC Directive 2014/30/EU, EN61326-1:2021

Optional Analog Interface	
Input Range	0 to 5 V or 0 to 10 V
Accuracy	± 0.2% of rating
Reference Output	0 to 5 VDC or 0 to 10 VDC (5 A max.)

(3) Time for output voltage to recover within 1% of its rated output voltage for a load change of 10-90%.
(4) Typical time required for output to begin to change following receipt of command data.
(5) At nominal line and maximum load.

Ordering Information

HMR Series Power Supplies

Model	Description
HMR80360	80 V / 360 A, 10 kW
HMR65046	650 V / 46 A, 10 kW
HMR130023	1300 V / 23 A, 10 kW
HMR500108	500 V / 108 A, 18 kW
HMR195027	1950 V / 27 A, 18 kW

Optional Accessories

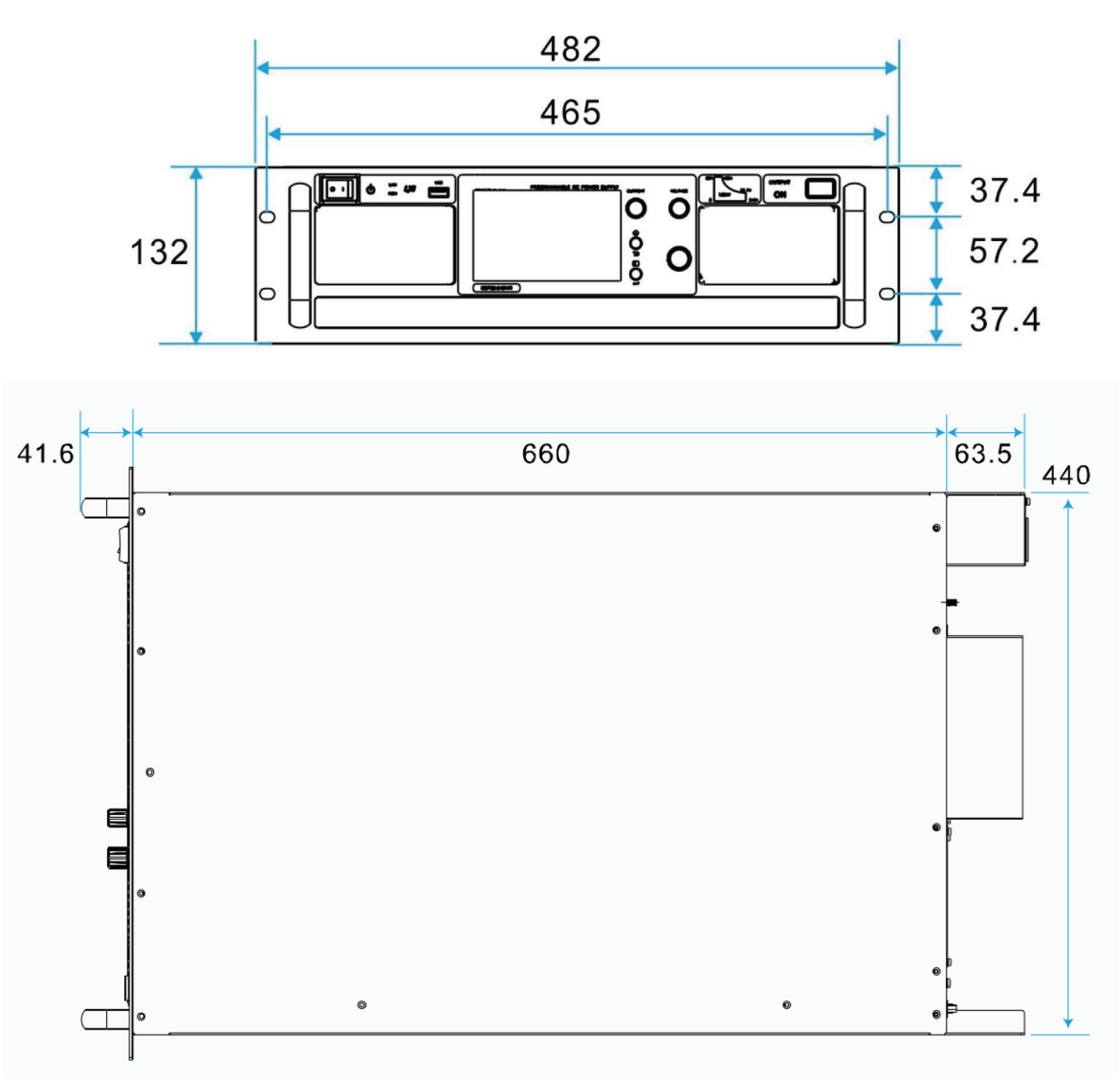
Part Number	Description
HMRGPIB	GPIB Interface Card
HMRALG	Isolated Analog Interface Card
HMRPB	Parallel Bus Bars (HMR80360 only)
HMRPU180	Protection unit for models: HMR65046, HMR130023, HMR500108, HMR195027
HMRPU540	Protection unit for HMR80360


HMRPB

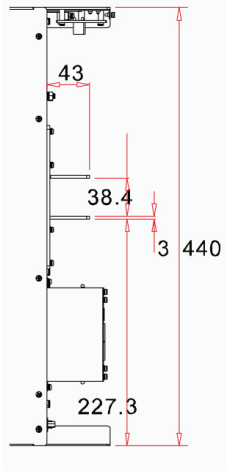
HMRALG

HMRGPIB

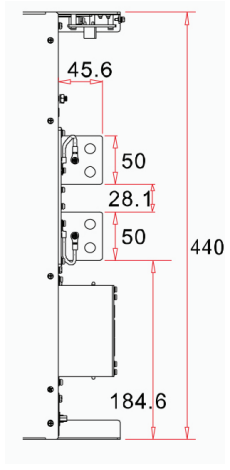
Dimensions



Output terminal measurements



Models: HMR65046, HMR130023, HMR500108, HMR195027



Model HMR80360

Measurements are in mm

About B&K Precision

For more than 70 years, B&K Precision has provided reliable and value-priced test and measurement instruments worldwide.

Our headquarters in Yorba Linda, California houses our administrative and executive functions as well as sales and marketing, design, service, and repair. Our European customers are most familiar with B&K through our French subsidiary, Sefram. Engineers in Asia know us through our B+K Precision Taiwan operation. The independent service centers in Singapore and Brasil service customers in Singapore, Malaysia, Vietnam, Indonesia and South America, respectively.

B&K Precision group member Independent service center Service center location

Quality Management System

B&K Precision Corporation is an ISO9001 registered company employing traceable quality management practices for all processes including product development, service, and calibration.

ISO9001:2015

Certification body NSF-ISR
Certificate number 6Z241-IS8

NSF-ISR
Registered to ISO 9001

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