



From our headquarters in Bridgewater, Connecticut, PMI develops and manufactures innovative components and subsystems for x-ray imaging. Founded in 1984, PMI celebrated its 25th anniversary with a launch of new products and application of patent technology for the medical, industrial and homeland security industries.

PMI core competencies and novel proprietary processes include technology derived from a fundamental knowledge of high voltage, metallurgy, vacuum and metals & plastics properties. OEM and aftermarket partners from all over the world have come to rely on PMI for expert guidance in systems development based on PMI patent technology combined with over 100-years of engineering experience.

With our state-of-the-art technological innovations, PMI has helped to advance the detection of disease, and has set new standards in components for CT, mammography, bone densitometry, x-ray & C-Arm applications, electron & proton therapy, scientific analysis, electron-beam welding and baggage & cargo inspection.

PMI product fabrication and validation services for x-ray imaging chain components range from high voltage cables & harnesses, flat connectors, receptacles, x-ray beam control & radiation shielding, x-ray tube cooling & oil processing, and x-ray measurement devices & subsystems.

The development of PMI's 11-acre corporate park adjacent to our Bridgewater headquarters affirms our vision of global leadership and our commitment to providing essential resources to our customers.



Parker Medical, Holland Joint Venture Vision

Parker Medical is a Holland family company, and, along with our sister company, Holland Joint Venture, we're realizing the results of vision, planning, determination and individual & collective talent. PMI is a global leader in x-ray component technology; HJV has invested in real estate opportunities to achieve PMI expansion plans.

PMI is uniquely positioned to offer employees an exceptional environment in which to work, a place to grow job skills and a career path. We work closely with the town of Bridgewater and surrounding communities on matters close to the heart of our employees, neighbors and community. We offer opportunities that strengthen family, the education process, the workforce and the economy.

PMI and the Holland family provide community support ranging from sponsoring high school senior projects to construction of a senior center, and everything in between. Parker Medical and Holland Joint Venture has positioned itself to meet the challenges of unemployment, homelessness, the need for vocational training, and providing critical support that comes from not only recognizing the needs of our neighbors, but how we fit in as a global neighbor and competitor.



Parker Medical, Vertically Integrated

PMI strives to maintain small-company character that promotes efficiency and sensitivity to customer needs, remove barriers that inhibit the pursuit of novel ideas. To this goal, PMI has positioned itself as a vertically-integrated company – producing most subcomponent parts in the PMI New Milford, CT machining, plastics molding and metal forming facilities.

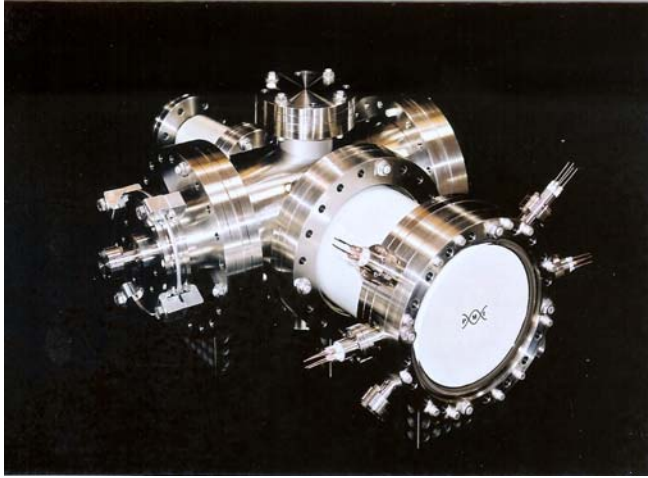
PMI Machining is equipped not only to machine a wide range of metal and plastic component parts, but to fabricate tooling for frames, fixtures & molds for injection, transfer and insert molding operations. PMI Machine has CNC screw machine, lathe turning and milling capabilities.

PMI Plastics capabilities include casting, injection and transfer molding of plastic parts: connectors, receptacles, strain reliefs, shields and custom components.

PMI Forming performs deep drawing of brass and other metals to support production assembly of PMI terminals and flat connectors. Deep drawing of custom parts can also be accommodated.

The PMI New Milford facilities are critical-to-success, critical-to-quality satellites for PMI Bridgewater R&D, engineering and production assembly.

This vertically-integrated approach allows quick turn-around of 1 part or 10,000 parts.



PMI's demountable chamber is an advanced method of performing x-ray source design experiments and high-vacuum parts processing, providing design validation, shorter design-to-manufacture cycles and reduced development costs. Operational features include:

- 140kVDC operation
- Evaluation of cathode beam optics/focal spot size control
- Grid control electron beam modulation
- Measure x-ray output conventional target vs. PMI-patented V-notch
- Measure beam size/filtration
- Experimentation capability of heat removal and thermal measurement
- Rotating bearing/stator drive experimentation
- Multiple x-ray source experimentation
- Process and outgas x-ray target assemblies
- Life test bearing systems.

Parker Medical, Technology Partner

PMI's 1984 charter to design, develop and manufacture superior x-ray imaging components has evolved over the years to advancing x-ray imaging technology. Principals at PMI have authored eighteen patents in x-ray technology, and currently have x-ray technology disclosures and patents pending.

- 3,178,503 X-Ray Apparatus Cables for Use in Explosive Hazardous Areas
- 3,567,939 Method & Apparatus for Mitigating Surface Disruption of X-Ray Tube Targets
- 3,650,846 Process for Reconstructing the Grain Structure of X-Ray Tube Targets
- 3,699,373 X-Ray Tube with electrically Conductive Bypass
- 3,743,836 Dual Filament X-Ray Tube
- 3,795,832 Rotating Anode Target
- 3,821,581 Targets for X-Ray Tubes
- 3,900,751 Warp Resistant Anode
- 3,946,261 Dual Filament X-Ray Tube
- 3,962,583 X-Ray Tube Focusing Means
- 3,982,059 Flexible Cable Termination
- 4,225,787 Pulsed Stator Motor Drive (Co-Inventor)
- 4,316,129 X-Ray Tube Control System
- 4,321,471 X-Ray Target Monitor
- 4,336,476 Grooved X-Ray Generator
- 6,320,936 X-Ray Tube Assembly with Beam Limiting Device for Reducing Off-Focus Radiation
- 7,012,989 Multiple Grooved X-Ray Generator
- 7,397,898 X-Ray Generator and Method

Parker Medical, Technical Capabilities

PMI employs an extensive portfolio of technical experience comprising over 100-years of engineering experience, patents, disclosures and proprietary processes, R&D resources and test equipment to provide comprehensive and critical design validation for high voltage components. Some of our capabilities include high voltage testing to 240kVDC and 500 KVP lightning impulse test (LIT), electrical stress modeling, x-ray tube components testing, testing of rotational mechanical systems in vacuum environment, output and leakage measurement of x-ray sources and application of plastics, elastomer and composite material knowledge.



PMI has core competencies in end-ground systems, and has designed superior connectors for both power supply and x-ray tube ends. PMI has developed fixtures and test procedures to measure compression to measure mechanical and electrical integrity. The test set-up shown to the left measures strength and deformation of weldments, which if exceeded could cause electrical failure or x-ray leakage. Following this design test, this connector was lightning impulse tested to 500KVP.



PMI has overvoltage test facilities for components design and production testing.



The PMI lead room is used for x-ray source experiments, radiation leakage measurement and development of novel x-ray devices.

Parker Medical, Flat Connectors & Gaskets



PMI introduced its first flat connector in 1985, rated at 60kV for a bone densitometry application. Since then, PMI has produced a range of flat connector assemblies with high performance compression gaskets.

PMI flat connectors are rated from 60kV to 300kV, and can be configured with 1-8 conductors. Typical cable configurations consist of a flat connector at the tube end and a federal standard, extended federal standard or conical, taper-style terminal at the power supply end.

Compression gaskets are produced to meet specified durometer and thermal requirements.

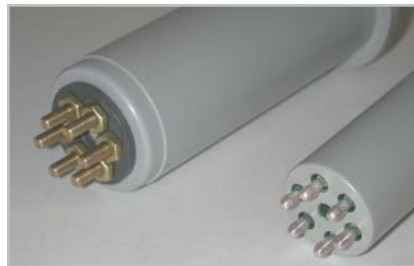
Parker Medical, Extended Federal Standard HV Cables & Receptacles

The federal standard terminal and receptacle have been used as a high voltage connection system for over fifty years. It has been used successfully for a wide variety of applications that the basic design has been accepted as an international standard. The typical federal standard 3-pin and 4-pin configurations are rated for 75KV. When assembled with a 100kV cable and PMI proprietary materials and processing techniques, the cable can be rated for 100KV operation. PMI has now extended this proven design to meet even higher KV operating voltages—160kV and 250kV. They are typically used in end-grounded systems, dual-pole equipment operating at over 250kV and test equipment

Typical cable configurations include the extended federal plug at both ends or other high kV HV terminations like the R24, R28 or the PMI “Iceberg” conical tapered type at the other end. The six-conductor configuration serves to power multiple focal spots and provide bias and pulse control. The following table describes the kV rating and pin configurations of the extended federal standard. For further electrical and mechanical details reference PMI drawings H453/H454 and H1449 specification for Type Q high voltage cable.



High-kV federal standard cables and receptacles: 100kV, 160kV and 250kV



H453 P6-100 six-conductor HV termination with H454 P6-100 receptacle

H453/H454 HV Cable/Receptacle Specification

Part Number	Pin Configuration	KvDC Rating	Cable Type	Mating Receptacle
H453 P1	-100 1-conductor center pin	100KV	M	H454 P1-100
	-160	160KV	Q1, E	H454 P1-160
	-250	250KV	E, F	H454 P1-250
H453 P3	-100 3-conductor federal standard	100KV	M	H454 P3-100
	-160	160KV	Q1, E	H454 P3-160
	-250	250KV	E, F	H454 P3-250
H453 P4S	-100 4-conductor symmetrical	100KV	G, H, N	H454 P4S-100
	-160	160KV	Q1, E	H454 P4S-160
	-250	250KV	E, F	H454 P4S-250
H453 P4G	-100 4-conductor grid	100KV	G	H454 P4G-100
	-160	160KV	Q1, E	H454 P4G-160
	-250	250KV	E, F	H454 P4G-250
H453 P5	-100 5-conductor grid with center pin	100KV	Q2	H454 P5-100
	-160	160KV	Q2	H454 P5-160
	-250	250KV	—	H454 P5-250
H453 P6	-100 6-conductor circular	100KV	Q2	H454 P6-100
	-160	160KV	Q2	H454 P6-160
	-250	250KV	—	H454 P6-250

Parker Medical, Novel Boot Concept Applied to 75kV – 250kV Applications



Tapered high voltage connectors are often necessary in confined space applications. However, some configurations like the R-Series suffer from high electrical stress (HEFS) and deformation of the elastomeric plug. A novel boot design has been applied to the PMI Mini-75 and "Iceberg" terminations with improved results.



PMI Mini-75 High Voltage Cable & Receptacle

PMI has a long history of designing and producing compact and miniature high voltage plugs and receptacles to replace the 75kV federal standard connector. These components are used on mammography, bone densitometry and c-arm applications, and scientific & analytical applications. Due to market demand, PMI has produced an improved mini-75 termination plug and receptacle. The PMI boot concept lends itself to more reliable operation.



PMI HV Connectors for the Toshiba Aquilion & Other CT Applications

The PMI H1887 HV cable assembly for the Toshiba Aquilion HV connector consists of an improved taper plug at one end and a flat connector at the other end. The PMI "Iceberg" taper plug has been designed with a novel boot gasket over a fixed plug for an improved fit in the x-ray tube high voltage receptacle. The PMI multiple-spring cap is integrally molded to the high voltage cable connector, and provides superior interface and compression characteristics over other steel compression cap styles. This method reduces electrical stresses and mechanical deformation in the cable plug.



Parker Medical, Global HV Cable & Receptacle

The PMI H2097 global cable and H1323 receptacle are cost-competitive utility components for applications ranging from general radiography to mobile units, to CT. The cable features a flexible .635-inch 75kV high voltage cable with federal standard 3-pin terminals with removable pins. Other features include straight or 90-degree molded strain reliefs and a removable ring nut with split collars that allow for ease of installation, and permit the use of insulating grease or oil. The cable and strain relief design provide an improved aesthetic appearance of the x-ray equipment.

PMI global HV components comply with NEMA XR-7 standard for high voltage x-ray cables and receptacles, and UL ZPFW2 File #E151173.

Additionally, PMI has performed validation tests to assure reliable performance. The PMI global connection system was lightning impulse tested (LIT) to 280 kV before breakdown (3-times the normal operating voltage).



Parker Medical, Molded High Voltage Cable Terminations

PMI molds special high voltage cable terminations in a variety of materials to adjust plug durometer, improve temperature characteristics, and increase dielectric strength and voltage rating. Material selection is critical in matching plug to receptacle and overall operating specifications. PMI material selection and molding techniques allow for size reduction while maintaining voltage rating. While many of the PMI plug/receptacle combinations have become industry standards, selecting both the PMI cable and receptacle ensures mechanical and electrical compatibility. PMI molded plug and receptacles range in voltage from 10kV to 250kV and are tested to exceed their operating voltage rating to ensure reliability and longer life.



H435 mini plug with recessed pins molded from EPR for vulcanized termination to cable insulation. Rated for 75kV, 1-4 conductors. Shown with H1541 P2 cathode receptacle.



H199 keyed taper plug rated for 75kV, 1-4 conductors. Shown with H355 cathode receptacle.



H190 mini plug (LGH-4) rated for 60kV, 1-2 conductors. Shown with H234 receptacle.



H189 compact plug rated for 60kV, 1-5 conductors. Shown with H78 receptacle.

Parker Medical, High Voltage Cable/Control Wire Harnesses

PMI produces high voltage cable/control wire harnesses for x-ray C-Arm equipment and equipment that requires cable runs through conduit. PMI's decades of experience in designing and producing compact x-ray components has culminated in the production of the most versatile, dependable and innovative harnesses. A variety of hose materials and diameters are available—all VW-1 rated. PMI custom molds cuffs and strain reliefs to match and meet aesthetic and mechanical equipment specifications. Cable/wire bundles are also customized and terminated to meet or exceed equipment operating voltage, mechanical and electrical requirements.



C-Arm harness in flexible "old-style" hose with federal standard terminations.



C-Arm harness in flexible, smooth hose with federal standard and mini 75kV molded terminations.



HV cable/control harness for C-Arm equipment.

Parker Medical, Federal Standard 75kV High Voltage Cables

PMI produces a wide range of 75KV federal standard high voltage cables. All types feature a low-noise construction and are recommended for use in applications sensitive to electrical noise. Cables are terminated with high density/high thermal capacity grey plugs configured with 1-6 contacts rated at 15-amperes. Proprietary assembly and processing techniques ensure no separation at cable/plug termination even after repeated flexure and multi-engagement. Following are the most common types of cable assemblies. Many types are stocked in 5-foot increment lengths and can be shipped the same day as an order, or assembled and shipped the following day.



PMI federal standard cables can be assembled with split metal straight/90-deg strain reliefs, 45-deg GE-style strain reliefs or PMI global molded straight or 90-deg strain reliefs with removable hardware and removable pins.

PMI federal standard cables range in application from 75kV general purpose to use in test tube bays of major tube manufacturers. PMI 75kV high voltage cables have been lightning impulse tested (LIT) to 280KVP.

PMI has over twenty high voltage cables in stock from which to select a type that meets your specification, and we work closely with our cable manufacturers to design and develop new cable designs.

Parker Medical, High Voltage Cables, Receptacles and Adapters for Mammography Equipment

PMI produces high voltage components for mammography equipment and for mammography equipment test. PMI mammography components are produced with superior component parts and assembly techniques. They are over-voltage tested to ensure reliable performance for their rated operation. Following are the most common types of cable, connector and adapter assemblies.

H493 Series Configurations:

P1: straight to 90-deg P5: 90-deg to banana plug
P2: straight to straight P6: straight to banana plug
P3: straight to federal P7: 90-deg to 90-deg
P4: 90-deg to federal

Accessories:

H44 P2 KVP adapter cable for equipment calibration, H1044 cable with federal standard plug to banana plug 10', for use with PMI H917 HV divider

H45 Federal standard plug/H1418 mammography receptacle with H27 P10 retaining nut

H1418 Mammography receptacle series



H493 P1 HV mammography cable with 90-degree and straight mammo terminations with H1418 receptacle.



GE DMR-style HV mammo termination with 4-pin federal standard grid plug.

Parker Medical, R-Series HV Cables & Receptacles

PMI produces a line of R-Series cables for medical, industrial and homeland security applications. The HV cable product line includes the R3, R5, R10, R24, R28 and R30. HV receptacles for most of the R-Series connectors are also offered.

A special elastomeric material used for the PMI taper plug is more resistant to the effects of high x-ray source temperatures and subsequent plug deformation. This results in less frequent maintenance and equipment service.



Parker Medical, High Voltage Cables for Industrial & Analytical Applications

PMI produces high voltage cables for x-ray diffraction (XRD) and x-ray fluorescence (XRF) applications, and x-ray inspection equipment. PMI produces both direct replacement parts for industry standard components and improved designs that offer increased electrical stability and higher thermal characteristics. Shown here are connectors that have been typically used over the years. PMI can also provide new designs that are more compact, have better thermal characteristics and lower cost.



ML style single-focus bi-plug and receptacle (also available in 3-pin dual-focus configuration).



ML style bi-plug shown with "coke bottle" adapter used in Seifert and Philips tube towers. PMI integral "coke bottle" termination eliminates bi-plug/adapter combination which frequently results in premature burnout of contacts due to electrical instability and overheating.



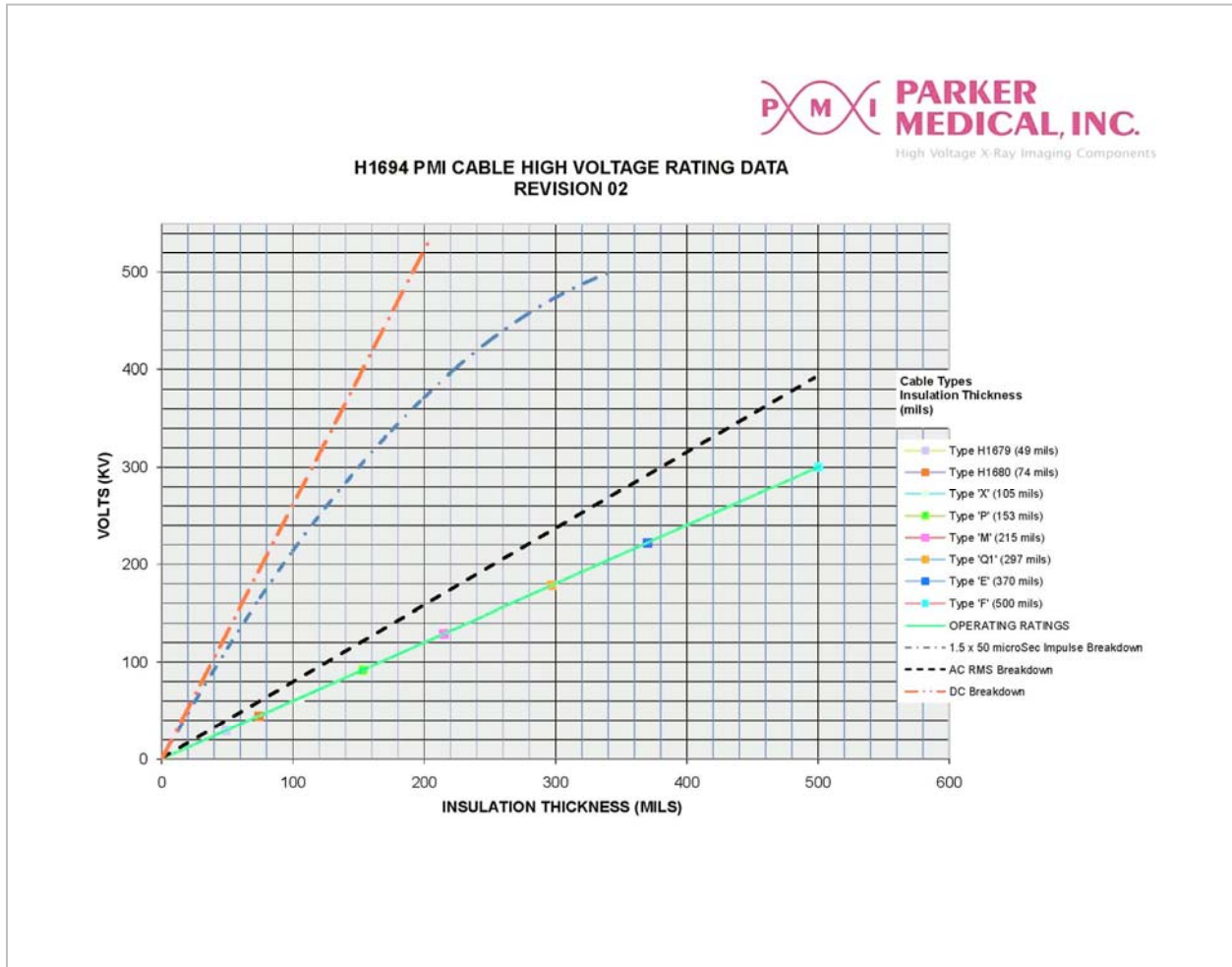
PMI H1052 series high voltage cable for Euro-standard tube towers with integral "coke bottle". PMI H1130 series cable (shorter coke-bottle) retrofits Philips 7V and Siefert tube towers. PMI integral "coke bottle" terminations provide superior electrical and thermal advantage.



PMI HV cables serve a wide range of NDT and material analysis applications for essentially all industries that use materials — from cement to semiconductor to pharmaceutical to petroleum, measuring aspects such as semiconductor film thickness, stress in turbine blades, groundwater contamination, and contaminant levels of fuel and plastics.

Parker Medical, H1694 Rev 02 High Voltage Cable Rating Data

Reliable high voltage (HV) operation of x-ray cables and equipment is dependent on the thickness of electrical insulation between conductors. The insulation is subject to occasional over-voltage arcs. Various PMI cable types are tested accordingly, to HV breakdown with lightning impulse (LIT), alternating current (AC) and direct current (DC) wave forms. The resultant "operating ratings" curve has established that the cables will sustain a voltage of 600 volts (DC) per mil.



Parker Medical, Federal Standard Field Termination Kits

PMI has developed a field termination kit for federal standard plugs that simplifies the termination procedure and provides a more reliable field-terminated cable. Kits are available for a full range of federal standard plug configurations. Each kit provides termination materials for one cable end. In most cases, mounting hardware from the existing cable can be reused for the new termination. Should new hardware be required, it can be selected from the accessory parts list or from the PMI Components Parts List for a more comprehensive parts selection. Selecting the proper kit is instrumental in ensuring terminal flare fit to cable diameter. The PMI HV Cable Specification offers electrical and mechanical details of cable designation codes referred to in the cable diameter type column.

Stock Field Termination Kits

Part Number	Pin Configuration	Flange Diameter			Cable Diameter			Sealing Gasket*
		Inches	MM	Type	Inches	MM	Type	
H875 P1	3-pin federal	1-9/16	39.7	small	0.785	20.0	M	H57 P2
H875 P2	4-pin grid	1-9/16	39.7	small	0.845	21.5	G	H57 P2
H875 P3	3-pin federal	2-3/16	55.6	large	0.785	20.0	M	H392
H875 P4	4-pin grid	2-3/16	55.6	large	0.845	21.5	G	H392
H875 P5	3-pin federal	1-9/16	39.7	small	0.650	16.5	L	H57 P2
H875 P6	4-pin grid	1-9/16	39.7	small	0.715	18.0	H, I	H57 P2
H875 P7	3-pin federal	2-3/16	55.6	large	0.605	15.5	A, P	H57 P1
H875 P8	4-pin grid	2-3/16	55.6	large	0.715	18.0	H, I	H57 P1
H875 P9	3-pin federal	1-9/16	39.7	small	0.605	15.5	A, P	H57 P2
H875 P10	3-pin federal	2-3/16	55.6	large	0.650	16.5	L	H57 P1
H875 P11	4-pin symmetrical	1-9/16	39.7	small	0.845	21.5	K, N	H57 P2
H875 P12	4-pin symmetrical	2-3/16	55.6	large	0.845	21.5	K, N	H57 P1
H875 P13	4-pin symmetrical	1-9/16	39.7	small	0.715	18.0	H, I	H57 P2
H875 P14	4-pin symmetrical	2-3/16	55.6	large	0.715	18.0	H, I	H57 P1
H875 P15	3-pin federal	1-9/16	39.7	small	0.460"	11.7	X	H57 P2

* Other terminal or receptacle sealing gaskets may be better suited for some applications. See accessory parts list for other selections.

Kit Contents (PMI Supplied)

H51 instruction procedure/drawing	heat shrink tubing	solder
H75 installation instruction	grounding ring	cotton swab
H1434 resin dispensing kit	plastic caps (3-4)	emery cloth
H69 insulating compound (1-oz)	plastic band	
plug with flare/contacts assembled	terminal gasket	

Kit Contents (Field Supplied)

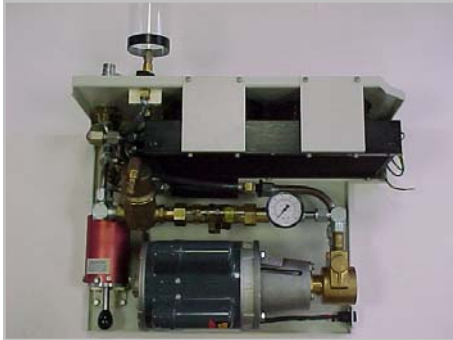
continuity meter	wire stripper	ruler
trim scissors (curved)	soldering iron/gun	utility knife
solvent (acetone)	heat gun	pliers

Accessory Parts List

H460 skirted cable nut	H111 90-degree split metal strain relief
H27 P1 spanner cable nut	H112 straight split metal strain relief
H216 wave washer	H1247 molded 45-degree elbow strain relief
H57 P1 terminal gasket (soft)	H69 P1 insulating compound 1-oz
H57 P2 terminal gasket (hard)	H69 P4 insulating compound 5.3-oz
H316 terminal oil seal gasket	H1434 resin dispensing kit
H392 receptacle quad ring	

Parker Medical, X-Ray Tube Cooling & Oil Processing

PMI x-ray tube cooling systems remove heat from the x-ray tube permitting increased tube loading and faster cooling. This allows greater throughput, longer operation and extends tube life. Several PMI designs not only cool the tube but replace some of the functions of the x-ray tube housing. Custom units have been developed to meet customer application requirements.



H296 High-Capacity Oil-Air Cooling System

The versatile H296 cooling unit was developed to perform functions other than cooling the x-ray tube. With selectable options the unit can be used to "top off" and continuously maintain clean and gas-free circulation. With the accumulator as a part of the cooling system the size of the x-ray tube unit can be reduced. Pressure, flow and temperature monitoring devices are optional to protect the x-ray tube. This cooling system can also be used to process and oil fill x-ray tubes in the field or repair/replacement facilities.

General Specifications

Cooling Capacity	8000 watts (dependent on oncoming fluid temperature)
Coolant Flow Rate	4-1/2 gallons per minute
Coolant	High dielectric strength oil or ethylene-glycol and de-ionized water

Power Specifications

Power Supply	
P1 Model	220 VAC, 3.5 A, 50/60 Hz
P2 Model	110 VAC, 6.8 A, 50/60 Hz

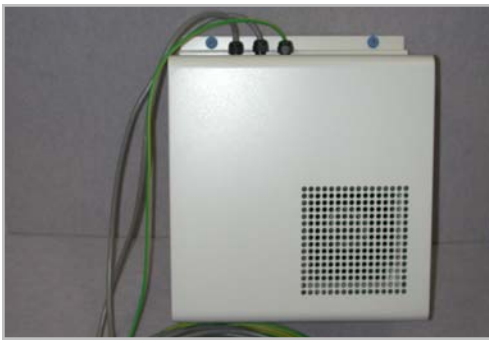
Physical Specifications

Cooling Unit Dimensions	24-CM H x 58-CM W x 42-CM D 9.5" H x 23" W x 16.5" D
Cooling Unit Weight	36 KG (80 Lbs) approx.

Options

Accumulator Pump	Evacuates/fills system, provides positive internal pressure preventing oil leaks inward, compensates for system volume changes
Ventilator	Removes gasses from coolant improving HV stability and cooling efficiency
Flow Meter	Indicates coolant flow with interlock switch with variable trip point
Coolant Filter	Removes contaminants from coolant and serves as an inspection window
Pressure Gauge	Monitors system pressure
Filling Reservoir	Used to introduce or remove coolant during maintenance procedures

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PMI Water-Air Cooling Units

PMI water-air cooling units remove heat from the x-ray tube housing permitting increased tube loading and cooling. The system is comprised of six major components assembled in a compact enclosure which can be mounted up to eighty feet from the x-ray tube, Ethylene-glycol and water is circulated through the system by means of a magnetically-coupled gear pump.

General Specifications

H114 Cooling Capacity	500 watts (dependent on incoming fluid temperature)
H551 Cooling Capacity	1300 watts (100,000 heat units per minute, dependent on incoming fluid temperature)
Ambient Air	0°C (86°F) maximum
Coolant Flow Rate	2 liters (1/2 gallon) per minute
Coolant Pressure	5 PSI (maximum)
Coolant Capacity (Reservoir)	1 liter (1 quart) approx.
Coolant Capacity (System)	2 liters (1/2 gallon) approx.
Coolant (EGW)	50% solution ethylene-glycol & de-ionized water

Power Specifications

Power Supply	
P1 Model	220 VAC, 1.5 A, 50/60 Hz
P2 Model	115 VAC, 2.0 A, 50/60 Hz
Power Cord (Motor)	18-MTR (60 FT) 3/C #16 AWG
Interlock Cord (Flow Switch)	18-MTR (60 FT) 2/C #18 AWG
Ground Wire	18-MTR (60 FT) 1/C #12 AWG
Power Cords(un-terminated)	

Physical Specifications

Cooling Unit Dimensions	37-CM H x 30.5-CM W x 15-CM D 14.5" H x 12" W x 6" D
Cooling Unit Weight	10KG (22 Lbs.) approx.
Hose (2)	24-MTR (80 FT) maximum 0.64-CM (1/4") ID

Environmental Specifications

Operating Environment	16°C to 40°C (61°F to 104°F) 15 to 95% RH
Transport and Storage	-30°C to 30°C (-22°F to 86°F) 0 to 95% RH

Oil-Air Cooling Units

The PMI H287 oil-air cooling unit circulates and cools the x-ray housing insulating oil.

General Specifications

Heat Dissipation	925 watts (75,000 heat units per minute) with air temperature at @ 26°C (75°F) and oil temperature @ 79°C (175°F)
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Power Specifications

H287-115	110-220 VAC, 1.7 A, 50/60 Hz
H287-230	220-230 VAC, 1.0 A, 50/60 Hz

Physical Specifications

Cooling Unit Dimensions	37-CM H x 30.5-CM W x 15-CM D 14.5" H x 12" W x 6" D
Cooling Unit Weight	10KG (22 Lbs.) approx.

Parker Medical, Devices for Calibrating and Troubleshooting High Voltage Equipment
H917 Dual-Pole Voltage Divider

The PMI H917 is a frequency compensated, 100-meg ohm, voltage divider designed to accurately test x-ray equipment. It has an impedance match and low frequency electrical characteristics similar to the GE C1515A and 46-15496681 voltage dividers. It can be used with single phase and three phase generators, and also provides excellent high frequency compensation for use with high frequency generators. With a well characterized rise time, the H917 divider is suitable for use in radiography, cine, pulse and mammography applications. It can be utilized for both high frequency and short exposures.

Unique to the H917 is its ability to be used in place of the GE C1515A voltage divider in closed loop calibrations of the AMX IV mobile unit and 9800 CT scanner. The PMI H917 divider can be used up to 100,000 Hz allowing more accurate timer and shutter calibrations and facilitating diagnosis of most power supply faults.

The divider provides two ranges, allowing it to be used with a variety of readout devices. One mode of operation provides the 1000:1 ratio into a 10-meg ohm load (in this mode it may be used as a replacement for the GE divider). It may also be connected to 10-meg ohm input impedance DC digital volt meters or 10-meg 10X scope probes. The second mode of operation is the 10,000:1 range when operated into a 1-meg ohm load such as the direct input of an oscilloscope.

The H917 is housed in an oil-filled steel container. It is light-weight and designed for rigorous transport and reliable field service.


H917 Specifications

Voltage Division Ratio	
Scope Mode	10,000:1 \pm 1%, 1-MEG Load
Direct Mode	1,000:1 \pm 1%, 10-MEG Load (GE Emulation)
Divider	100-MEG OHM, capacity Resistance compensated
KV Frequency	1% at DC
Response	3% at 1KHz
Accuracy	5% at 100KHz
Oil-Filled	Continuous operation
Voltage Range	0-150KVP, \pm 87.5KVP per side Maximum in 3-phase applications
Weight	32 Lbs. (15.5 KG)
Dimensions	12" Diameter X 10" High
HV Connectors	Federal Standard 3-pin with optional 4-pin grid federal connector for cathode, other connectors available
Supplied with	(2) BNC cables, 15-foot Oil-tight selector switch
Storage	Avoid freezing temperatures max accuracy is at 70°F
Manufactured	USA
Accessories	H496 HV calibration cables 5' (Federal) H493-005 P3 HV calibration cable 5' (Mammography) H45 Federal/Mammo adapter plug H44 Lorad mammo equipment calibration cable
Calibration	Traceable to NIST, recommended annually

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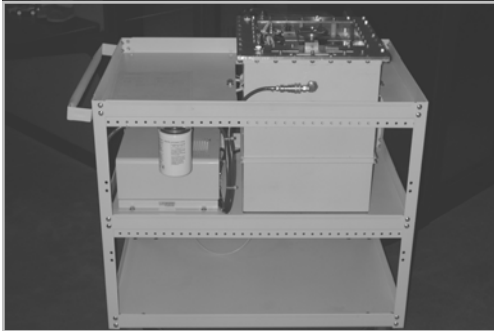
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H1049 Mono-Pole Voltage Divider



The PMI H1049 150kV HV divider is a 200-meg ohm, high frequency compensated high voltage calibration unit designed to test x-ray equipment and other high voltage instruments. Its precision provides accurate measurement for laboratory, manufacturing, systems integration, and installation and service applications. The unit is small and lightweight. With a well-characterized rise time, the H1049 divider may be used with single phase, three phase and constant potential high voltage generators and for both pulsed and high frequency exposures.

H986 HV Load Simulator



The PMI H986 load simulator is a device which tests power supply output in normal operating mode and with a simulated load. The switchable load is rated at 100kV and is provided with a circulating oil heat exchanger that provides cooling for continuous duty. High voltage connections can be customized by selecting from PMI's wide range of HV receptacles and cables. Other instruments that can be used in conjunction with the load simulator include the PMI H1049 mono-pole 160kV divider, the H917 75kV divider for dual-pole x-ray systems and the H1374 transient current monitor.

Specifications provided on request.

H1049 Specifications

Operating Voltage	190kVDC short term (max) 150kVDC continuous
Divider Ratio	10,000:1 / 1,000:1 switchable
Input Resistance	200-MEG OHM
Response Accuracy	1% AT 1KHz DC 5% AT 1KHz—20KHz 10% AT 20KHz—100KHz
Weight	30 Lbs.
Dimensions	12" diameter x 12" high
HV Receptacles	
H1049 P1	H454 P3-160 160 kV Ext Fed Std 3-pin
H1049 P2	H1419 P2 R24 (other receptacles available on request)
Output Connector	BNC
Supplied with	(1) BNC cable 15-Ft, ground stud, carrying handle
Storage	Avoid freezing temperatures Max accuracy is at 70°F
Manufactured	USA
Accessories	
H1049 P1	PMI H453-005 P3-160 Jumper cable 5'
H1049 P2	PMI H1376-005 R24 Jumper cable 5'
CALIBRATION	Traceable to NIST, recommended annually

H1374 Transient Current Monitor



The PMI H1374 transient current monitor is placed in the high voltage circuit to measure HV noise and arcs with high-temporal resolution.

Specifications provided on request.

Parker Medical, High Voltage Switch Tank, Junction Fittings & Extension Cables



The PMI H850 high voltage switch tank permits multiple x-ray tube operation from a single high voltage generator and control. The switch tanks are available for two, three or four tube control. Typically the high voltage sockets are the three-pin federal standard type, however, the tanks can be outfitted with four-pin grid control sockets or other types which will accommodate special high voltage tubes and equipment. For high voltage operation above 75kV, tanks can be furnished with 160KV and 250KV sockets. PMI also manufactures the high voltage cables for connecting these units.



The PMI H528 extension cable series is rated to 100kV. The extension cable features a junction fitting at one end that can accommodate most 75-100kV terminal types. A high voltage cable to customer specified length terminated with appropriate plug connects to the power supply. The extension cable allows equipment staging in the factory and cable installation at the site. Another use is to distance high voltage connections from sensitive medical equipment. Higher kV extension cables are also offered.



H1253 HV cable junction fittings serve as an intermediate splice between two HV cables having the same or different plug terminations. The shock-proof fittings are potted with a high voltage insulating compound. They can be used as a high voltage termination with an appropriate "dummy" plug in the other receptacle. The junction fittings are offered with different voltage ratings, sizes, number of conductors and terminal types. PMI federal standard, extended federal standard and R24 types are most common.

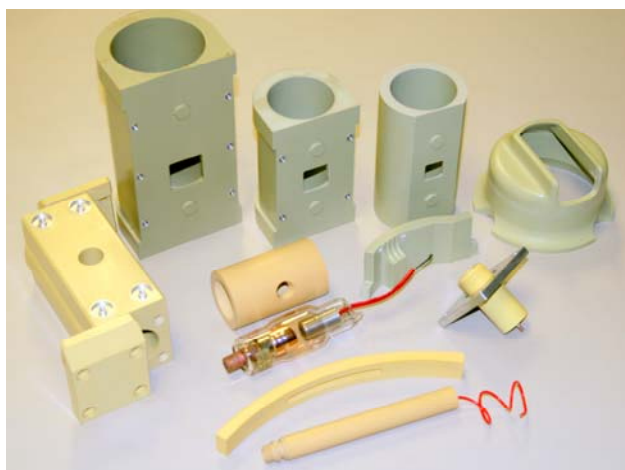


H1445 junction tank operates in a similar fashion as the H1253 cable junction fitting, however, the insulating medium is oil. The junction tank will accommodate higher voltage connectors to 250kV.

Parker Medical, X-Ray Shields & Collimating Devices

PMI manufactures a line of x-ray shielding products that represent a significant improvement from the traditional components that historically have been used to provide collimation, radiation shielding and scatter reduction. Standard and custom products include x-ray tube mounts, x-ray attenuation shields, HV receptacle shields, rotor shields, primary collimators, radiation stops and blades and x-ray scatter reduction devices.

These devices improve x-ray imaging resolution by reducing the negative effects of scattered x-ray and unwanted x-ray leakage. They are preferred over products that either contains lead or lead-compounds for both attenuation and shielding properties where hazardous material and safety compliance issues are of concern. In addition, the excellent electrical insulating property the use of plastic provides results in improved high voltage operation.



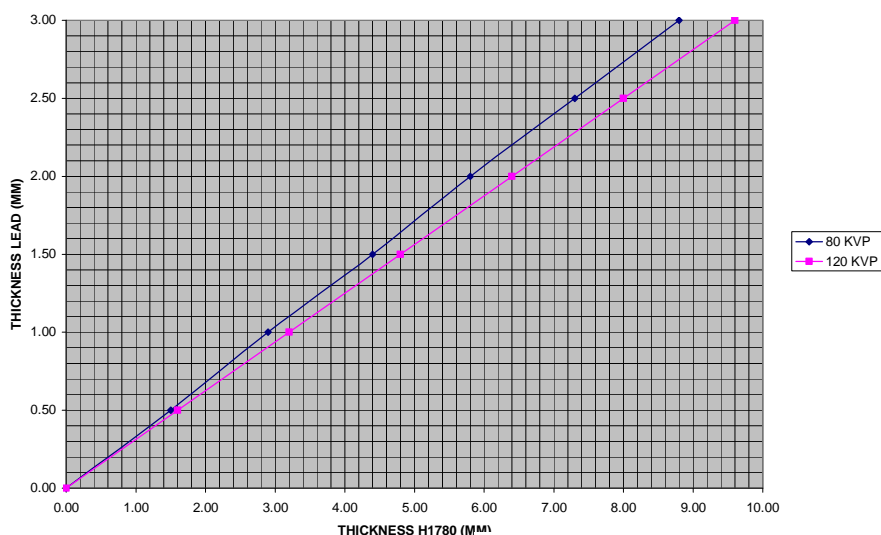
PMI formulates materials specifically designed for radiation shielding applications where close proximity to HV components is necessary. A variety of materials are compounded for both prototype designs and production manufacturing. PMI formulations are ideal for intricate parts design. Mounting inserts and other component parts can be encapsulated in the molding process.

Physical properties include resistance to mineral oil and most hydrocarbons up to a 155-degC service temperature, and can be used to provide mechanical support to the x-ray tube insert.

Specific gravity formulations range from 4.0 to 11.0.

U.S. Patent 6,320,936 X-Ray Tube Assembly with Beam Limiting Device for Reducing Off-Focus Radiation applies.

X-RAY ABSORPTION OF LEAD VS H1780 X-RAY SHIELD MATERIAL



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PMI EPOXY CASTABLE X-RAY SHIELDS

This data sheet lists the properties of a single formulation satisfying the shielding requirements for many x-ray tube housing assemblies. As noted, the shields retain electrical insulative properties for reducing the intensity of high voltage stress and enhance overall high voltage performance.

The H1780 X-Ray Absorption of Lead vs. H1780 X-Ray Shield Material curve illustrates the x-ray absorptive characteristics of H1780 compared to lead for energies of 80 and 120 KVP. It is shown that H1780 has about one third the x-ray absorption of lead.

H1780 Rev 01 Epoxy Castable X-Ray Shield Material

Typical Cured Properties

- Specific gravity (g/cc) 4.5
- Hardness, shore D 90
- Tensile strength (psi) 8,100
- Compressive strength @25°C, psi 13,200
- Service temperature, °C -60 to 155

Typical Thermal Properties

- Thermal conductivity, W/mK .3
- Coefficient of thermal exp, in/in/°C $\times 10^{-6}$ 38
- Thermal resistance @°C/in/W 128

Typical Electrical Properties

- Volume resistivity @25°C, ohm-cm 10^{15}
- Dielectric constant @25°C, 100KC 4.1
- Dissipation factor @25°C, 100KC 0.02
- Dielectric strength, volts/mil 400-500

Color

yellow-green

Toxicity

RoHS Compliant
pending

Disclaimer: These properties were determined by laboratory testing and although the values are believed to be correct and typical, they should serve only as a guide. Actual property evaluation and suitability for a particular purpose may require other specified tests. Each user must identify and perform all tests and analyses necessary to assure that its finished parts using PMI products will be safe and suitable for use under end-use conditions. Each user bears full responsibility for making its own determination as to the suitability of PMI products, recommendations or advice for its own particular use.



University of Connecticut
FAMILY BUSINESS PROGRAM

Parker Medical has been selected as an honoree for the 2010 Connecticut Family Business of the Year Award and will be honored at a ceremony on December 1st at the University of Connecticut. We received several hundred nominations and approximately 30 outstanding applications for consideration. Parker Medical rose to the top – showing outstanding achievements in business success, positive family/business linkage, multiple generation family involvement, care and contribution to community and industry, and innovative business practices or strategies. We welcome you to the roster of 143 firms already honored across the state since 1995.

Parker Medical, in the News

- 2010-Nov PMI conducts meetings at the 2010 RSNA scientific assembly and annual meeting in Chicago.
- 2010-Oct The Holland family announces Parker Medical, Inc. will be honored as a recipient of the 2010 Connecticut Family Business of the Year award. PMI is committed to practicing and preserving the unique resource of the family business concept benefitting technology, creating and maintaining jobs in Connecticut, strengthening our economy, and providing guidance and inspiration to future generations.
- 2010-Aug PMI launches four new products for key industry demand: the PMIHV Global cable, HV cable connector for Aquilion CT, Mini-75 HV cable & receptacle, and Akron HV cable connectors.
- 2009-Jul PMI salutes Varian Medical Systems in Manufacturing Today article.
- 2009-May PMI celebrates 25th anniversary with BBQ for employees.
- 2008-Jul PMI awarded Patent No. US 7,397,898 X-Ray Generator and Method.
- 2008-Feb PMI purchases and installs AED (automatic external defibrillator), and receives training as part of Bridgewater's Heartsafe community initiative.
- 2007-Jun PMI ramps CT flat connector production from 60-90 connectors per week.
- 2006-Mar PMI awarded Patent No. US 7,012,989 Multiple Grooved X-Ray Generator.
- 2005-Jan PMI entrusted with x-ray tubes and antique x-ray equipment to curate museum.

