SECTION 11600

LABORATORY EQUIPMENT

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\*\* NOTE TO SPECIFIER \*\* Miele Professional; laboratory equipment, glassware washers,  
This section is based on the products of Miele Professional, which is located at:  
9 Independence Way  
Princeton, NJ 08540  
Toll Free Tel: 866-781-5053  
Tel: 609-419-9898  
Fax: 609-419-4298  
Email: [request info (prosales@miele.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Miele+Professional&coid=46081&rep=&fax=609-419-4298&message=RE:%20Spec%20Question%20(11600mpp):%20%20&mf=)  
Web: <https://www.mieleusa.com/professional/index.htm>   
 [ [Click Here](https://www.arcat.com/arcatcos/cos46/arc46081.html) ] for additional information.  
Miele Professional leads the way in the development of innovative technology and meets the highest demands in cleaning and disinfection in commercial applications. Providing true commercial cleaning systems with outstanding speed, capacity, and performance, our laboratory glassware washers are showcased in school and research labs, life science and pharma institutions. Miele laboratory glassware washers set the standard for analytically clean labware. With state-of-the-art systems that guarantee commercial durability and commercial throughput without sacrificing unparalleled quality, exclusivity, and ease of use, Miele is the definitive source for precision commercial cleaning equipment. 90% of a Miele labwasher is recyclable, made of high grade 304/316 stainless steel for years of rust-free use. All plastic components are clearly marked to facilitate recycling.  
Miele Laboratory Glassware Washers also have a factory rated machine life of 15,000 operating hours. If a washer is used 5 hours a day, 5 days a week, this translates into 15 years of operation and many Miele washers last far beyond that time frame.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Laboratory equipment of the following types:
       1. Undercounter 115 V glassware lab washer.
       2. Undercounter Flex Series glassware washers.
       3. Free standing glassware washers.
       4. Mid chamber glassware washers
       5. Large chamber glassware washers.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 15050 - Basic Mechanical Materials and Methods.
    2. Section 16050 - Basic Electrical Materials and Methods.
  1. SUBMITTALS
     1. Submit under provisions of Section 01300 - Administrative Requirements.
     2. Product Data: Describe unit construction, size, finish and features, including:
        1. Model proposed for use.
        2. Utility requirements.
        3. Basket configuration.
        4. Preparation instructions and recommendations.
        5. Storage and handling requirements and recommendations.
        6. Installation methods.
     3. Operational and Maintenance Manual: Includes safety instructions, operating instructions, machine care and troubleshooting minor problems.
  2. QUALITY ASSURANCE

\*\* NOTE TO SPECIFIER \*\* Add qualification requirements of acceptable manufacturers. Delete if not required.

* + 1. Manufacturer Qualifications: Equipment shall be manufactured in a facility which is registered with ISO 9001 quality system.

\*\* NOTE TO SPECIFIER \*\* Add qualification requirements of acceptable installer. Delete if not required.

* + 1. Installer Qualifications: Factory trained and approved for installation of equipment specified.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of operation and application workmanship.
       1. Install equipment designated by Architect.
       2. Do not proceed with remaining work until workmanship and operation are approved by Architect.
       3. Correct mock-up area as required to produce acceptable work.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Store products in manufacturer's unopened packaging until ready for installation.
  2. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
  3. WARRANTY, MAINTENANCE AND SERVICE CONTRACTS

\*\* NOTE TO SPECIFIER \*\* Delete warranty not required.

* + 1. One year parts and labor warranty shall be provided.
    2. Additional extended coverage in the form of yearly service contracts, that may include regular maintenance, for up to 10 years, may be purchased, as an option. Coverage of parts resulting from normal wear and tear, and/or manufacturing defects.
    3. Documented calibration such as Installation Qualification (IQ) or yearly Operational Qualification (OQ) to test measuring systems and components are available to purchase.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Miele Professional, which is located at: 9 Independence Way; Princeton, NJ 08540; Toll Free Tel: 866-781-5053; Tel: 609-419-9898; Fax: 609-419-4298; Email: [request info (prosales@miele.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Miele+Professional&coid=46081&rep=&fax=609-419-4298&message=RE:%20Spec%20Question%20(11600mpp):%20%20&mf=); Web: <https://www.mieleusa.com/professional/index.htm>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01600 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. LABORATORY GLASSWARE WASHERS - GENERAL
     1. Wash cabinet and water path shall be capable of utilizing heated 18 megohm pure water without damage to the washer.
     2. Glassware washer chamber shall be laser welded, exterior to wash cabinet eliminating interior weld marks where corrosion can occur.

\*\* NOTE TO SPECIFIER \*\* Miele undercounter dishwashers offer the lowest water consumption in the industry - 2.4 gpf. Delete if not required.

* + 1. Under-the-Counter Type Laboratory Glassware Washer: Water consumption shall be a maximum of 2.4 gpf.
    2. Mid Chamber Laboratory Glassware Washer: Water consumption shall be 7.42 gpf (PLW6111).
    3. Large Chamber Laboratory Glassware Washer: Water consumption shall be 12.40 gpf (PLW8615, 8616, 8617).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. UNDER-COUNTER 115V GLASSWARE WASHER

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Miele Model PLW 8505. Laboratory glassware washer with powerful circulation pump for laboratory applications.
       1. Construction:
          1. Construction Type: Undercounter.
          2. Full-glass door.
          3. Outer Casing: Stainless steel.
          4. Electrical door lock.
          5. Buzzer, acoustic signal at end of program.
          6. Service-friendly design.
       2. Application:
          1. Suitable for laboratories.
          2. Capacity: Narrow-Neck Glassware per Cycle: 39.
       3. Performance Data:
          1. Circulation pump Qmax: 118.9 gal (450 L) per min.
          2. Maximum Final Rinse Temperature: 199 degrees F (93 degrees C).
          3. Wash Cabinet Usable Capacity: 5.33 cu ft (151 L).
       4. Controls:
          1. Control system: Electronic controls.
          2. Program selection: Touch on glass.
          3. Short-cut buttons.
          4. Programs: 7.
          5. Free program positions: 2.
          6. Time left display.
          7. Program sequence indicator.
          8. Selectable display languages.
       5. Standard Electrical Connection:
          1. Electrical Connection: AC 115 V 60 Hz,
          2. Heater Rating: 1.0 kW.
          3. Total Connected Load: 1.6 kW.
          4. Fuse Rating: 20 Amp.
          5. NEMA Plug: 5 to 20.
          6. Approval: c UL us Listed.

UL 61010-1:2012-05/ CAN/CSA C22.2 No. 61010-1-12

UL 61010-2-040 CAN/CSA C22.2 No. 61010-2-040:16

* + - * 1. Length of Power Cord: 6 ft (2 m).
      1. Water Connection/Drainage:
         1. Cold water.
         2. Hot water.
         3. Fully demineralized water.
         4. Required flow pressure: 14.5 to 116 psi (100 to 800 kPa).
         5. Maximum Water Hardness; cold water/hot water: 0.710 gpg (11.97 mg per L).
         6. Drain Pump: 0 7/8 inch (22 DN)
      2. Dimensions and Weight:
      3. External Net Dimensions (HxWxD): 33-1/2 x 23-5/8 x 24.875 inch (850 x 600 x 630 mm).
      4. External Gross Dimensions (HxWxD): 39-7/8 x 61 x 29-1/4 inches (1010 x 786 x 740 mm).
      5. Wash Cabinet (HxWxD): 26-5/8 x 21-1/8 x 19-1/2 inches (650 x 535 x 495 mm).
      6. Maximum Floor Loading: 337 lbf (1500 N).
      7. Net Weight: 144 lbs (65 kg).
      8. Gross Weight: 172 lbs (78 kg).
      9. Emissions: Sound pressure at workplace: Less than 70 dB(A) re 20 &#181;Pa.
      10. Programs:
          1. Custom 1.
          2. Custom 2.
          3. Prewash.
          4. Short.
          5. Standard.
          6. Intensive.
          7. Analytic.
          8. Microbiology.
          9. Plastics.
      11. Features:
          1. Dispenser pump for liquid cleaning agent.
          2. Dispenser pump for neutralizer.
          3. Steam condenser.
          4. Pump with high circulation rate.
          5. Load carriers - direct connection.
          6. Drying via heating elements.
          7. Wash cabinet made of high-quality stainless steel (1.4404).
  1. UNDER-COUNTER FLEX SERIES GLASSWARE WASHERS

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Under-the-Counter Type Laboratory Glassware Washer:
       1. Miele Model PG 8504 for Powder Detergent Dispensing: Undercounter laboratory glassware washer accepts a wide variety of baskets and inserts for various laboratory glassware types. Model features three wash programs, three utility programs and one open program slot and is capable of direct injection washing of narrow neck glassware (with proper inserts). Automatic powder detergent and neutralizer dispenser located in door. Equipped with built-in water softener.
       2. Exterior Overall Dimensions:
          1. With Lid; Standard: 32.9 inches high by 23.6 inches wide by 23.6 inches deep (835 mm by 600 mm by 600 mm).
          2. Without Lid: 32.3 inches high by 23.5 inches wide by 23.5 inches deep (820 mm by 598 mm by 598 mm).
       3. Wash Cabinet Dimensions: 20.6 inches high by 21.1 inches wide by 20.6 inches deep (522 mm by 536 mm by 523 mm).

\*\* NOTE TO SPECIFIER \*\* Delete electrical requirement not required.

* + - 1. Electrical Connections::
         1. Standard: 3 AC 208 V 60 Hz, 6.1 kW total load, fuse rating 3-pole 20 Amp, NEMA L15-20 plug.
         2. Convertible To: 2 AC 208 V 60 Hz, 6.1 kW total load, fuse rating 2-pole 30 Amp, NEMA L6-30 plug.
      2. Approvals: c CSA us.

No. 61010-1 (2nd Edition), IEC 61010-2-040:2006, CAN/CSA-C22.2

No. 61010-1-04, CAN/CSA-C22.2 No. 61010-2-040.

* + - 1. Plumbing Connections:
         1. Water Connection: One 5 foot 7 inch (1,700 mm) long inlet hose is provided with washer for connection to 3/4 inch male garden hose thread. Source can be either hot or cold tap water. Recommended flow pressure >= 29 psi (200 kPa), minimum pressure with extended water intake 14.5 psi (100 kPa) for cold water and 5.8 psi (40 kPa) for hot water, maximum pressure 145 psi (1,000 kPa), throughput 2 gal/min (7.5 l/min). Maximum incoming water temperature 150 degree F (65 degree C).
         2. DI Water Connection: One 5 foot 7 inch (1,700 mm) long inlet pressure hose provided for connection to 3/4 inch male garden hose thread; DI water connection for a pressurized system with 4.4 - 145 psi (30 - 1,000 kPa) gage pressure: recommended flow pressure >= 29 psi (200 kPa), minimum flow pressure with extended water intake 4.4 psi (30 kPa), throughput 2 gal/min (7.5 l/min); DI water connection for a non-pressurized system with < 4.4 psi (30 kPa) gage pressure requires the installation of an external booster pump, which can be requested through Miele Service, installation of the pump must be carried out by Miele Service.
         3. Drain Connection: One 7/8 inch (22 mm) OD flexible drain hose, 4 foot 6 inch (1,400 mm) long is provided with washer for connection to a separate standpipe, maximum drain height is 3 foot 3 inch (1,000 mm), flow rate is 4.2 gal/min (16 l/min).
      2. Construction:
         1. Exterior Cabinet: Constructed of type 304 stainless steel, lid included, space frame construction allows easy removal of side and top panels for service and recycling at end of machine life, double-skinned design, insulated door for excellent soundproofing.
         2. Interior: Chamber walls, ceiling and door are constructed of type 304 stainless steel. Chamber floor is constructed of type 316 L stainless steel.
         3. Net Weight: 159 lbs (72 kg).
      3. Operation:
         1. Control: Touch Control with 3 row display showing program name, actual/target temperature and remaining program time.
         2. Programs: Normal, Regular, Extended, DI Rinse, Rinse, Drain, one freely programmable program slot.
         3. Final Rinse Temperature: 158 degree F (70 degree C).
      4. Design:
         1. Pump: Variable-speed brushless pump with integrated heater elements, up to 3,400 rpm, Qmax 132 gal/min (500 l/min).
         2. Water Softener: Built-in adjustable water hardness control, with automatic reactivation program.
         3. Detergent Dispensing: Automatic powder detergent dispenser located in door.
         4. Neutralizer Dispensing: Automatic liquid neutralizer dispenser, approx. 10 oz. (300 ml) capacity located in door.
         5. Additional External Dispensing: If required one additional external dispensing module (DOS module) can be added by Miele Service for liquid process chemicals.
         6. Salt Container: For up to 4 lbs (2 kg) of reactivation salt, located in door.
         7. Water-Proof System: Incoming hot/cold and DI water lines are double wall with electronically activated solenoids. Includes float sensor in washer drip pan. In event of leak float switch is tripped which shuts of incoming water and activates drain pump.
         8. Test Port: Access port for monitoring of wash temperatures for process validation.
         9. Flow Meter: Water intakes include flow meters to measure water fill level. Allows for adjustable water levels. System includes back-up float switch to protect against over-fill.
         10. Filter: 4-fold filter system with large surface filter, coarse filter, glass breakage filter and micro-fine filter,.
         11. Wash Chamber: Laser-welded, crevice-free chamber made out of high-grade stainless steel, rear docking, no exposed heating elements, up to three levels of cleaning.
         12. Spray Arms: Upper and lower spray arm with knife edge jet pattern, optional basket with third spray arm available.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Under-the-Counter Type Laboratory Glassware Washer:
       1. Miele Model PG 8583 LD for Liquid Detergent Dispensing: Undercounter laboratory glassware washer accepts a wide variety of baskets and inserts for various laboratory glassware types. Model features eleven wash programs, three utility programs and two open program slots and is capable of direct injection washing of narrow neck glassware (with proper inserts). Equipped with EcoDry drying assistance, steam condenser, spray arm monitoring and built-in water softener. Two internal pumps for liquid dispensing.
       2. Miele Model PG 8583 PD for Powder Detergent Dispensing: Undercounter laboratory glassware washer accepts a wide variety of baskets and inserts for various laboratory glassware types. Model features eleven wash programs, three utility programs and two open program slots and is capable of direct injection washing of narrow neck glassware (with proper inserts). Equipped with EcoDry drying assistance, steam condenser, spray arm monitoring and built-in water softener. No internal pump.
       3. Miele Model PG 8583 OIL for Liquid Detergent Dispensing: Undercounter laboratory glassware washer, oil sealed version, accepts a wide variety of baskets and inserts for various laboratory glassware types. Model features eleven wash programs, three utility programs and two open program slots and is capable of direct injection washing of narrow neck glassware (with proper inserts). Equipped with EcoDry drying assistance, steam condenser, spray arm monitoring and built-in water softener. Model equipped with oil resistant seals and gaskets. Two internal pumps for liquid dispensing.
       4. Exterior Overall Dimensions:
          1. With Lid; Standard: 32.9 inches high by 23.6 inches wide by 23.6 inches deep (835 mm by 600 mm by 600 mm).
          2. Without Lid: 32.3 inches high by 23.5 inches wide by 23.5 inches deep (820 mm by 598 mm by 598 mm).
       5. Wash Cabinet Dimensions: 20.6 inches high by 21.1 inches wide by 20.6 inches deep (522 mm by 536 mm by 523 mm).

\*\* NOTE TO SPECIFIER \*\* Delete electrical requirement not required.

* + - 1. Electrical Connections::
         1. Standard: 3 AC 208V 60Hz, 6.2 kW total load, fuse rating 3-pole 20 Amp, NEMA L15-20 plug.
         2. Convertible To: 2 AC 208V 60Hz, 6.2 kW total load, fuse rating 2-pole 30 Amp, NEMA L6-30 plug.
      2. Approvals: c CSA us.

No. 61010-1 (2nd Edition), IEC 61010-2-040:2006, CAN/CSA-C22.2

No. 61010-1-04, CAN/CSA-C22.2 No. 61010-2-040.

* + - 1. Plumbing Connections:
         1. Hot Water Connection: One 5 foot 7 inch (1,700 mm) long inlet hose provided for connection to 3/4 inch male garden hose thread. Recommended flow pressure >= 29 psi (200 kPa), minimum pressure with extended water intake 5.8 psi (40 kPA), maximum pressure 145 psi (1,000 kPa), throughput 2 gal/min (7.5 l/min). Maximum incoming water temperature 150 degree F (65 degree C).
         2. Cold Water Connection: Two 5 foot 7 inch (1,700 mm) long inlet hoses provided for connection to 3/4 inch male garden hose thread. Recommended flow pressure >= 29 psi (200 kPa), minimum pressure with extended water intake 14.5 psi (100 kPA), maximum pressure 145 psi (1,000 kPa), throughput 2 gal/min (7.5 l/min). Maximum incoming water temperature 68 degree F (20 degree C). Two cold water connections required. One connection is for wash, second connection for steam condenser. Use supplied Y-adapter if only one cold water connection is available.
         3. DI Water Connection: One 5 foot 7 inch (1,700 mm) long inlet pressure hose provided for connection to 3/4 inch male garden hose thread; DI water connection for a pressurized system with 4.4 - 145 psi (30 - 1,000 kPa) gage pressure: recommended flow pressure >= 29 psi (200 kPa), minimum flow pressure with extended water intake 4.4 psi (30 kPa); throughput 2 gal/min (7.5 l/min); DI water connection for a non-pressurized system with < 4.4 psi (30 kPa) gage pressure requires the installation of an external booster pump, which can be requested through Miele Service, installation of the pump must be carried out by Miele Service.
         4. Drain Connection: One 7/8 inch (22 mm) OD flexible drain hose, 4 foot 11 inch (1,500 mm) long is provided with washer for connection to a separate standpipe, maximum drain height is 3 foot 3 inch (1,000 mm), flow rate is 4.2 gal/min (16 l/min).
      2. Construction:
         1. Exterior Cabinet: Constructed of type 304 stainless steel, lid included, space frame construction allows easy removal of side and top panel for service and recycling at end of machine life, double-skinned design, insulated door for excellent soundproofing.
         2. Interior: Chamber walls, ceiling and door are constructed of type 304 stainless steel. Chamber floor is constructed of type 316 L stainless steel.
         3. Net Weight: 163 lbs (74 kg).
      3. Operation:
         1. Control: Touch Control with 3 row display showing program name, actual/target temperature and remaining program time.
         2. Programs: Universal, Standard, Intensive, Inorganic materials, Organic materials, Injector Plus, Pipettes, Plastics, Eco Wash (Mini), Oil Program, Special 93 degrees C-10' (199 degrees F), Demineralized water rinse, Rinse, Drain, two freely programmable program slots.
         3. Final Rinse Temperature: Adjustable up to 199 degrees F (93 degree C).
      4. Design:
         1. Pump: Variable-speed brushless pump with integrated heater elements, up to 3,400 rpm, Qmax 132 gal/min (500 l/min).
         2. Water softener: Built-in adjustable water hardness control, with automatic reactivation program.
         3. Salt Container: located in door, for up to 4 lbs (2 kg) of reactivation salt.
         4. Water-Proof System: Incoming hot, cold and DI water lines are double wall with electronically activated solenoids. Includes float sensor in washer drip pan. In event of leak float switch is tripped which shuts of incoming water and activates drain pump.
         5. Test Port: Access port for monitoring of wash temperatures for process validation.
         6. Flow Meter: water intakes include flow meters to measure water fill level. Allows for adjustable water levels. System includes back-up float switch to protect against over-fill.
         7. Filter: 4-fold filter system with large surface filter, coarse filter, glass breakage filter and micro-fine filter,.
         8. Wash Chamber: laser-welded, crevice-free chamber made out of high-grade stainless steel, rear docking, no exposed heating elements, up to three levels of cleaning.
         9. Spray Arms: upper and lower spray arm with knife edge jet pattern, optional basket with third spray arm available.
         10. Drying System: EcoDry - automatic door opening at the end of the program to assist drying.
      5. Certifications: ACT Label Sustainability: PG8583 LD

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Under-the-Counter Type Laboratory Glassware Washer:
       1. Miele Model PG 8593 for Liquid Detergent Dispensing: Undercounter laboratory glassware washer accepts a wide variety of baskets and inserts for various laboratory glassware types. Model features eleven wash programs, three utility programs and two open program slots and is capable of direct injection washing of narrow neck glassware (with proper inserts). Equipped with DryPlus HEPA-filtered forced-air drying, steam condenser, spray arm monitoring and built-in water softener. One internal and external pump for liquid dispensing.
       2. Exterior Overall Dimensions:
          1. With Lid; Standard: 32.9 inches high by 23.6 inches wide by 23.6 inches deep (835 mm by 600 mm by 600 mm).
          2. Without Lid: 32.3 inches high by 23.5 inches wide by 23.5 inches deep (820 mm by 598 mm by 598 mm).
       3. Wash Cabinet Dimensions: 20.6 inches high by 21.1 inches wide by 20.6 inches deep (522 mm by 536 mm by 523 mm).

\*\* NOTE TO SPECIFIER \*\* Delete electrical requirement not required.

* + - 1. Electrical Connections::
         1. Standard: 3 AC 208V 60Hz, 6.2 kW total load, fuse rating 3-pole 20 Amp, NEMA L15-20 plug.
         2. Convertible to: 2 AC 208V 60Hz, 6.2 kW total load, fuse rating 2-pole 30 Amp, NEMA L6-30 plug.
      2. Approvals: c CSA us

No. 61010-1 (2nd Edition), IEC 61010-2-040:2006, CAN/CSA-C22.2

No. 61010-1-04, CAN/CSA-C22.2 No. 61010-2-040.

* + - 1. Plumbing Connections:
         1. Hot Water Connection: One 5 foot 7 inch (1,700 mm) long inlet hose provided for connection to 3/4 inch male garden hose thread. Recommended flow pressure >= 29 psi (200 kPa), minimum pressure with extended water intake 5.8 psi (40 kPA), maximum pressure 145 psi (1,000 kPa), throughput 2 gal/min (7.5 l/min). Maximum incoming water temperature 150 degree F (65 degree C).
         2. Cold Water Connection: Two 5 foot 7 inch (1,700 mm) long inlet hoses provided for connection to 3/4 inch male garden hose thread. Recommended flow pressure >= 29 psi (200 kPa), minimum pressure with extended water intake 14.5 psi (100 kPA), maximum pressure 145 psi (1,000 kPa), throughput 2 gal/min (7.5 l/min). Maximum incoming water temperature 68 degree F (20 degree C). Two cold water connections required. One connection is for wash, second connection for steam condenser. Use supplied Y-adapter if only one cold water connection is available.
         3. DI Water Connection: One 5 foot 7 inch (1,700 mm) long inlet pressure hose provided for connection to 3/4 inch male garden hose thread; DI water connection for a pressurized system with 4.4 - 145 psi (30 - 1,000 kPa) gage pressure: recommended flow pressure >= 29 psi (200 kPa), minimum flow pressure with extended water intake 4.4 psi (30 kPa); throughput 2 gal/min (7.5 l/min); DI water connection for a non-pressurized system with < 4.4 psi (30 kPa) gage pressure requires the installation of an external booster pump, which can be requested through Miele Service, installation of the pump must be carried out by Miele Service.
         4. Drain Connection: One 7/8 inch (22 mm) OD flexible drain hose, 4 foot 11 inch (1,500 mm) long is provided with washer for connection to a separate standpipe, maximum drain height is 3 foot 3 inch (1,000 mm), flow rate is 4.2 gal/min (16 l/min).
      2. Construction:
         1. Exterior Cabinet: Constructed of type 304 stainless steel, lid included, space frame construction allows easy removal of side and top panel for service and recycling at end of machine life, double-skinned design, insulated door for excellent soundproofing.
         2. Interior: Chamber walls, ceiling and door are constructed of type 304 stainless steel. Chamber floor is constructed of type 316 L stainless steel.
         3. Net Weight: 172 lbs (78 kg).
      3. Operation:
         1. Control: Touch Control with 3 row display showing program name, actual/target temperature and remaining program time.
         2. Programs: Universal, Standard, Intensive, Inorganic materials, Organic materials, Injector Plus, Pipettes, Plastics, Eco Wash (Mini), Oil Program, Special 93 degrees C-10' (199 degrees F), Demineralized water rinse, Rinse, Drain, two freely programmable program slots.
         3. Final Rinse Temperature: Adjustable up to 199 degrees F (93 degree C).
      4. Design:
         1. Pump: Variable-speed brushless pump with integrated heater elements, up to 3,400 rpm, Qmax 132 gal/min (500 l/min).
         2. Water softener: Built-in adjustable water hardness control, with automatic reactivation program.
         3. Detergent Dispensing: One internal pump for liquid dispensing using a siphon.
         4. If required two additional external dispensing modules (DOS modules can be added by Miele Service for dispensing of neutralizer and liquid process chemicals.
         5. Salt Container: located in door, for up to 4 lbs (2 kg) of reactivation salt.
         6. Water-Proof System: Incoming hot, cold and DI water lines are double wall with electronically activated solenoids. Includes float sensor in washer drip pan. In event of leak float switch is tripped which shuts of incoming water and activates drain pump.
         7. Test Port: Access port for monitoring of wash temperatures for process validation.
         8. Flow Meter: water intakes include flow meters to measure water fill level. Allows for adjustable water levels. System includes back-up float switch to protect against over-fill.
         9. Filter: 4-fold filter system with large surface filter, coarse filter, glass breakage filter and micro-fine filter,.
         10. Wash Chamber: laser-welded, crevice-free chamber made out of high-grade stainless steel, rear docking, no exposed heating elements, up to three levels of cleaning.
         11. Spray Arms: upper and lower spray arm with knife edge jet pattern, optional basket with third spray arm available.
         12. Drying System: DryPlus - HEPA-filtered forced-air drying system circulates hot air through chamber and injectors to thoroughly dry glassware. Includes ability to program in a cool-down step at end of cycle for user safety.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Under-the-Counter Type Laboratory Glassware Washer:
       1. Miele Model PG 8583 CD for Liquid Detergent Dispensing: Undercounter laboratory glassware washer accepts a wide variety of baskets and inserts for various laboratory glassware types. Model comes with side cabinet for detergent storage and features eleven wash programs, three utility programs and two open program slots and is capable of direct injection washing of narrow neck glassware (with proper inserts). Equipped with DryPlus HEPA-filtered forced-air drying, steam condenser, spray arm monitoring, conductivity meter and built-in water softener. Two internal pumps, with an option to use additional two.
       2. Miele Model PG 8583 CD OIL for Liquid Detergent Dispensing: Undercounter laboratory glassware washer, oil sealed version, accepts a wide variety of baskets and inserts for various laboratory glassware types. Model comes with side cabinet for detergent storage and features eleven wash programs, three utility programs and two open program slots and is capable of direct injection washing of narrow neck glassware (with proper inserts). Equipped with DryPlus HEPA-filtered forced-air drying, steam condenser, spray arm monitoring, conductivity meter and built-in water softener. Model equipped with oil resistant seals and gaskets. Two internal pumps, with an option to use additional two.
       3. Exterior Overall Dimensions:
          1. With lid (standard): 32.9 inches high by 35.4 inches wide by 27.6 inches deep (835 mm by 900 mm by 700 mm).
          2. Without lid: 32.3 inches high by 35.4 inches wide by 27.5 inches deep (820 mm by 898 mm by 698 mm).
       4. Wash Cabinet Dimensions: 20.6 inches high by 21.1 inches wide by 20.6 inches deep (522 mm by 536 mm by 523 mm).
       5. Electrical Connections::
          1. Standard: 3 AC 208V 60Hz, 6.2 kW total load, fuse rating 3-pole 20 Amp, NEMA L15-20 plug.
          2. Convertible to: 2 AC 208V 60Hz, 6.2 kW total load, fuse rating 2-pole 30 Amp, NEMA L6-30 plug.
       6. Approvals: c CSA us

No. 61010-1 (2nd Edition), IEC 61010-2-040:2006, CAN/CSA-C22.2

No. 61010-1-04, CAN/CSA-C22.2 No. 61010-2-040.

* + - 1. Plumbing Connections:
         1. Hot Water Connection: One 5 foot 7 inch (1,700 mm) long inlet hose provided for connection to 3/4 inch male garden hose thread. Recommended flow pressure >= 29 psi (200 kPa), minimum pressure with extended water intake 5.8 psi (40 kPA), maximum pressure 145 psi (1,000 kPa), throughput 2 gal/min (7.5 l/min). Maximum incoming water temperature 150 degree F (65 degree C).
         2. Cold Water Connection: Two 5 foot 7 inch (1,700 mm) long inlet hoses provided for connection to 3/4 inch male garden hose thread. Recommended flow pressure >= 29 psi (200 kPa), minimum pressure with extended water intake 14.5 psi (100 kPA), maximum pressure 145 psi (1,000 kPa), throughput 2 gal/min (7.5 l/min). Maximum incoming water temperature 68 degree F (20 degree C). Two cold water connections required. One connection is for wash, second connection for steam condenser. Use supplied Y-adapter if only one cold water connection is available.
         3. DI Water Connection: One 5 foot 7 inch (1,700 mm) long inlet pressure hose provided for connection to 3/4 inch male garden hose thread; DI water connection for a pressurized system with 4.4 - 145 psi (30 - 1,000 kPa) gage pressure: recommended flow pressure >= 29 psi (200 kPa), minimum flow pressure with extended water intake 4.4 psi (30 kPa); throughput 2 gal/min (7.5 l/min); DI water connection for a non-pressurized system with < 4.4 psi (30 kPa) gage pressure requires the installation of an external booster pump, which can be requested through Miele Service, installation of the pump must be carried out by Miele Service.
         4. Drain Connection: One 7/8 inch (22 mm) OD flexible drain hose, 4 foot 11 inch (1,500 mm) long is provided with washer for connection to a separate standpipe, maximum drain height is 3 foot 3 inch (1,000 mm), flow rate is 4.2 gal/min (16 l/min).
      2. Construction:
         1. Exterior Cabinet: Constructed of type 304 stainless steel, lid included, space frame construction allows easy removal of side and top panel for service and recycling at end of machine life, double-skinned design, insulated door for excellent soundproofing.
         2. Interior: Chamber walls, ceiling and door are constructed of type 304 stainless steel. Chamber floor is constructed of type 316 L stainless steel.
         3. Net Weight: 216 lbs (98 kg).
      3. Operation:
         1. Control: Touch Control with 3 row display showing program name, actual/target temperature and remaining program time.
         2. Programs: Universal, Standard, Intensive, Inorganic materials, Organic materials, Injector Plus, Pipettes, Plastics, Eco Wash (Mini), Oil Program, Special 93 degrees C-10' (199 degrees F), Demineralized water rinse, Rinse, Drain, two freely programmable program slots.
         3. Final Rinse Temperature: Adjustable up to 199 degrees F (93 degree C).
      4. Design:
         1. Pump: Variable-speed brushless pump with integrated heater elements, up to 3,400 rpm, Qmax 132 gal/min (500 l/min).
         2. Water softener: Built-in adjustable water hardness control, with automatic reactivation program.
         3. Detergent Dispensing: one internal pump for liquid dispensing using a siphon.
         4. Neutralizer Dispensing: one internal pump for liquid dispensing using a siphon.
         5. Additional Liquid Dispensing: If required one additional internal pump can be installed by Miele Service.
         6. Salt Container: For up to 4 lbs (2 kg) of reactivation salt, located in door.
         7. Water-Proof System: Incoming hot, cold and DI water lines are double wall with electronically activated solenoids. Includes float sensor in washer drip pan. In event of leak float switch is tripped which shuts of incoming water and activates drain pump.
         8. Test Port: Access port for monitoring of wash temperatures for process validation.
         9. Flow Meter: water intakes include flow meters to measure water fill level. Allows for adjustable water levels. System includes back-up float switch to protect against over-fill.
         10. Filter: 4-fold filter system with large surface filter, coarse filter, glass breakage filter and micro-fine filter.
         11. Wash Chamber: laser-welded, crevice-free chamber made out of high-grade stainless steel, rear docking, no exposed heating elements, up to three levels of cleaning.
         12. Spray Arms: upper and lower spray arm with knife edge jet pattern, optional basket with third spray arm available.
         13. Spray Arm Monitoring: the rotation speed of the spray arm is being monitored during a wash cycle. Blockages due to loading errors and build-up of foam can be identified and dealt with promptly.
         14. Drying System: DryPlus - HEPA-filtered forced-air drying system circulates hot air through chamber and injectors to thoroughly dry glassware.
         15. Conductivity Monitoring: standard conductivity meter measures the wash water conductivity in the final rinse phase.
         16. Side cabinet for detergent storage.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. FREE STANDING GLASSWARE WASHER

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Free Standing Laboratory Glassware Washer:
       1. Miele Model PG 8536 Free-Standing Electrically Heated Model: Freely programmable laboratory glassware washer accepts baskets and optional inserts designed to hold laboratory glassware, including baskets for direct injection cleaning of narrow-necked glassware on one or two levels. Includes HEPA-filter forced air drying system, built-in liquid detergent and neutralizer dispensers and integrated water softener, spray arm sensing to monitor spray arm speed and/or blockage, built in maintenance free conductivity meter.

\*\* NOTE TO SPECIFIER \*\* Miele provides numerous baskets and inserts for various applications. Please contact manufacturer for assistance in selecting or include: E 385 half injector with 19 jets (drying connection) and AK 12 stainless steel utility basket half insert.

* + - 1. Washer baskets, washer inserts and washer accessories:

\*\* NOTE TO SPECIFIER \*\* List basket type, washer inserts and accessories required.

* + - * 1. Schedule:
      1. Exterior Overall Dimension: 46.25 inches high by 35.43 inches wide by 27.56 inches deep (1175 mm by 900 mm by 700 mm).
      2. Interior useable space: 19.69 inches high by 21.1 inches wide by 19.69 inches deep (500 mm by 536 mm by 500 mm).
      3. Electrical Requirement: 208V, 60Hz, 20 Amp, 6.8 kW total load.
      4. Approval: c CSA us

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UL 61010-2-040 CAN/CSA C22.2 No. 61010-2-040:16

* + - 1. Plumbing Connections:
         1. Hot Tap Water Connection for Wash Cycle: One 1/2 inch (13 mm) ID pressure hose, 5 feet 7 inches (1702 mm) long provided for connection to 3/4 inch (19 mm) male hose thread. Maximum incoming water temperature (158 degree F (70 degree C). Input pressure 25 psi (172 kPa) to 145 psi (1000 kPa).
         2. Cold Tap Water Connection for Rinse Cycles and Steam Condenser: Two 1/2 inch (13 mm) ID pressure hoses, 5 feet 7 inches (1702 mm) long provided for connection to 3/4 inch (19 mm) male hose thread. Input pressure 25 psi (172 kPa) to 145 psi (1000 kPa).
         3. Final DI Rinse Water Connection: One 1/2 inch (13 mm) ID pressure hose, 5 feet (1524 mm) long provided for connection to 3/4 inch (19 mm) male hose thread. Maximum incoming water temperature 158 degree F (70 degree C). DI water source input pressure shall be 25 psi (172 kPa) to 145 psi (1000 kPa). Optional DI pump kit is required for input pressure less than 10 psi (70 kPa).
         4. Drain Connection: Two 7/8 inches (22 mm) ID flexible drain hoses, 4 feet 11 inches (1499 mm) long, provided for connection to separate or one combined standpipe. Maximum drain height is 3 feet (914 mm), maximum length 13 feet (3962 mm), flow rate is 2.5 gallons per minute (9.5 l/minute) from wash chamber hose, 1 gallon per minute (3.8 l/minute) from steam condenser hose.
      2. Construction:
         1. Interior: Chamber walls and ceiling are constructed of type 304 stainless steel. Chamber is laser welded, exterior to wash cabinet allowing for no weld marks where corrosion could occur. Chamber floor and door are constructed of type 316 stainless steel. All surfaces are polished for increased corrosion-resistance.
         2. Exterior Cabinet: Constructed of type 304 brushed stainless steel for corrosion-resistance.
      3. Operation: Automatic Wash Programs include.
         1. Sixty four total program slots.
         2. Fourteen pre-programmed standard laboratory wash programs with DI rinse.
         3. Fifteen utility programs including automatic water softener regeneration program and detergent dispenser and neutralizer dispenser primer programs.
         4. Thirty-five customizable wash programs.
      4. Design:
         1. Dual Pump System: Washer incorporates separate pumps for circulation and draining to eliminate cross-contamination and increased pump life.
         2. Water Softener: Built-in adjustable water hardness control, with water softener reactivation program and indicator light.
         3. Detergent Dispenser: Automatic bellows type liquid detergent dispenser. Dispenses 3.6 oz per minute from 1.3 gal (120 ml per minute from 5 L) container integrated within washer.
         4. Neutralizer Dispenser: Automatic bellows type liquid acid neutralizer dispenser. Dispenses 0.6 oz per minute (20 ml per minute) from 0.4 gal (1.5 L) container integrated within cabinet.
         5. Spray arm with sensor for automatic spray arm monitoring of rotation and/or blockages of spray arms.
         6. Standard conductivity monitor using maintenance free self-calibrating conductivity meter.
         7. Circulation Pump: Rated at 158 gallons per minute (598 l per minute), constructed with ABS plastic impeller and housing.
         8. Wash Water Temperature: Adjustable up to 203 degree F (95 degree C) maximum temperature.
         9. Final Rinse Water Temperature: Adjustable up to 203 degree F (95 degree C) maximum temperature.
         10. Heater Rating: 6000 W heater for efficient, fast heating.
         11. Drying System: HEPA filtered forced air drying cycle with adjustable temperatures and time Hot air can be blown through optional spindle injectors for thorough drying of interior of narrow-necked glassware.
         12. Steam Condenser: Integrated steam condenser eliminates the need for hook-up to building ventilation system.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. MID LABORATORY GLASSWARE WASHERS

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Miele Model PLW 6111. Laboratory washer with 3 wash levels in SlimLine design with steam condenser, boiler, printer, conductivity meter, and chamber lighting.
       1. Heating Type: Electricity.
       2. Pre-Heating: Boiler
       3. Electrical Requirement: 3 AC 208V, 60Hz, 8.25 kW total load.
       4. Approval: c UL us Listed
          1. UL 61010-1:2012-05/ CAN/CSA C22.2 No. 61010-1-12
          2. UL 61010-2-040 CAN/CSA C22.2 No. 61010-2-040:16
       5. Front, Back, and Side Panels: Stainless steel.
       6. SlimLine design.
       7. Number of Wash Levels: 3.
       8. Loading and Unloading: Telescopic runners.
       9. Electrical door lock.
       10. Buzzer: Acoustic signal at end of program.
       11. Capacity: Per cycle.
           1. 100 mL Bottles: 126.
           2. 250 mL Bottles: 84.
           3. 1000 mL Bottles: 40.
           4. Vials: 468.
           5. Pipettes: 121.
       12. Performance Data:
           1. Circulation Pump Qmax: 0.044 gal per min (700 L per min).
           2. Usable Capacity: 7.42 cu ft (210 L).
       13. Controls:
           1. Control System: MP.CON 3.
           2. Program Selection: Touch on Glass.
           3. Programmability: Freely programmable.
           4. Programs: 18. Free Program Positions: 20.
           5. Program continuation in event of power outage.
           6. Time left display.
           7. Program sequence indicator.
           8. Selectable display languages.
       14. Water Connection and Drainage:
           1. Cold and hot water.
           2. Fully demineralized water.
           3. Required Flow Pressure: 14.5 to 116 psi (100 to 800 kPa).
           4. Maximum Water Hardness; cold water/hot water: 0.700 gpg (11.97 mg per L).
           5. Drain Pump: 7/8 inch dia (22 DN).
       15. Drying Unit:
           1. Heating Mode Drying Unit: Electricity.
           2. Air Throughput: 150 cfm (88.33 cu m per hour).
           3. Temperature Settings in 1.8 degrees F (1 degree C) Steps: 32 to 248 degrees F (0 to 120 degrees C).
           4. Time Setting in 1 minute Steps: 0 to 120 minutes.
           5. HEPA Filter Class: H14.
           6. Filtration Efficiency HEPA Filter per DIN EN 1822: 99.995 percent.
           7. HEPA Filter Service Life: 1,000 hours.
           8. Electric Heater Rating: 4.0 kW.
       16. Dimensions and Weight:
           1. External Net Dimensions (HxWxD): 73-5/8 x 25-5/8 x 27-1/8 inches (1870 x 650 x 687 mm).
           2. External Gross Dimensions (HxWxD): 83-1/8 x 37-1/4 x 33-1/8 inches (2110 x 945 x 840 mm).
           3. Wash Cabinet (HxWxD): 26-1/4 x 21-3/8 x 23-1/8 inches (665 x 540 x 585 mm).
           4. In-Feed Height Above Floor: 33-1/2 inches (850 mm).
           5. Gross Weight: 574 lbs (260 kg). Net Weight: 554 lbs (251 kg).
           6. Maximum Floor Loading: 899 lbf (4000 N).
       17. Emissions data
           1. Sound Pressure LpA in cleaning and drying according to DIN EN ISO 11201: Less than 70 dB(A) re 20 &#181;Pa.
           2. Heat Dissipation into Room: 1,26 btu (1.33 J) per hour.
       18. Programs
           1. Mini.
           2. Universal.
           3. Oil.
           4. Standard.
           5. Organic.
           6. Inorganic.
           7. Plastics.
           8. Pipettes.
           9. Disinfection 93C-10.
           10. Tap Rinse.
           11. DI Rnse.
           12. Drying.
       19. Features:
           1. Integrated Hose Dispenser Pumps for Liquid Media: 2.
           2. Boiler for preheating fully demineralized water.
           3. Integrated Steam condenser - standard.
           4. Volumetric dispensing control.
           5. Conductivity monitoring (depending on version).
           6. Interface for cycle documentation.
           7. Multi-component filter system.
           8. Load carriers - direct connection.
           9. Integrated hot-air drying.
           10. Integrated printer for cycle documentation.
           11. Wash cabinet made from high-quality stainless steel (1.4404/316 L)
           12. Base.
           13. Chamber lighting.
       20. Connection Options: RS 232 serial interface.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. LARGE LABORATORY GLASSWARE WASHERS
     1. Miele Model PLW 8615. Lab washer, electric heating - single door, 35-7/16 inches (900 mm) wide, 12.40 cu ft (351 L) usable capacity.
        1. Heating Type: Electricity, Steam or both (depending on versions)
        2. Pre-Heating: Combi Tank (depending on versions)
        3. Electrical: 3 AC 208 V, 60 Hz Heater rating: 19.0 KW
        4. Approval: c MET us
           1. UL 61010-1:2012-05/ CAN/CSA C22.2 No. 61010-1-12
           2. UL 61010-2-040 CAN/CSA C22.2 No. 61010-2-040:16
        5. Front, Back, and Side Panels: Stainless steel.
        6. Loading via load carriers.
        7. Electrical door lock.
        8. Buzzer: Acoustic signal at end of program.
        9. Capacity: Per cycle.
           1. 100 mL bottles: 216.
           2. 250 mL bottles: 120.
           3. 1000 mL bottles: 60.
           4. Vials: 588.
           5. Pipettes: 294.
        10. Performance Data:
            1. Circulation Pump Qmax:
            2. Fixed: Spray Arms: 400 L/min.
            3. Variable: Injectors: 600 L/min.
            4. Wash Cabinet Usable Capacity: 12.40 cu ft (351 L).
            5. Tested Operating Hours: 15,000.
            6. Tested Service Life in Wash Cycles: 20,000.
        11. Controls:
            1. Program Selection: Full-touch color display.
            2. Programmability: programmable.
            3. Programs: 30.
            4. Free Program Positions: 170.
            5. Program continuation in event of power outage.
            6. Time left display.
            7. Status indication via chamber lighting.
            8. Program sequence indicator.
            9. Selectable display languages.
        12. Water Connection/Drainage:
            1. Cold and hot water.
            2. Fully demineralized water.
            3. Required Flow Pressure in kPa: 29 to 145 psi (200 to 1,000 kPa).
            4. Maximum Water Hardness; cold water/hot water: 0.710 gpg (12.14 mg per L).
            5. Dump Valve: 2 inch (50 DN).

\*\* NOTE TO SPECIFIER \*\* Drain pump is optional. Delete if not required.

* + - * 1. Drain Pump (retrofitted during installation). Max Head Height: 3 m
      1. Compressed Air Connection: 1.
         1. Required Air Pressure, Technical, in kPa: 87 to 116 psi (600-800 kPa).

\*\* NOTE TO SPECIFIER \*\* Drying unit is optional. Delete if not required.

* + - 1. Drying Unit:
         1. Heating Mode: Electricity.
         2. Air Throughput: 250 cfm (147.22 cu m per hour).
         3. Temperature Settings in 1.8 degrees F (1 degree C) Steps: 140 to 239 degrees F (60 to 115 degrees C).
         4. Time Setting in 1 minute Steps: 1 to 240 minutes.
         5. HEPA Filter Class: H14.
         6. Filtration efficiency HEPA filter per DIN EN 1822: 99.950 percent.
         7. HEPA Filter Service Life: 1,000 hours.
         8. Electric Heater Rating: 8.0 kW.
      2. Dimensions and Weight:
         1. External Net Dimensions (HxWxD): 98-1/4 x 35-1/2 x 39 inches (2495 x 900 x 990 mm).
         2. External Dimensions Including Plinth/Floor Tray and Top Casing: 98-1/4 inch (2495 mm).
         3. External Gross Dimensions (HxWxD): 81-1/2 x 44-1/2 x 39-3/8 inches (2070 x 1130 x 1000 mm).
         4. Wash Cabinet (HxWxD): 26-5/8 x 25-5/8 x 31-1/2 inches (675 x 650 x 800 mm).
         5. In-Feed Height Above Floor: 33-1/2 inch (850 mm).
         6. Gross Weight: 1213 lbs (550 kg). Net Weight: 962 lbs (436 kg).
         7. Maximum Floor Loading in N: 1798 lbf (8000 N).
      3. Programs:
         1. Mini.
         2. Standard.
         3. Universal.
         4. Intensive.
         5. Inorganic.
         6. Organic.
         7. Agar.
         8. Plastics.
         9. Vials.
         10. Pipettes.
         11. Special 93C-10.
         12. Tap Rinse.
         13. DI Rinse.
         14. Drying.
      4. Features:
         1. Two integrated dispenser pumps for liquid cleaning agent dispensing: 1 x 5L + 1 x 10 L.
         2. Additional integrated dispenser pumps: Up to max 2 (depending on canister size).
         3. Volumetric dispensing control.
         4. Conductivity monitoring.
         5. Spray arm monitoring.
         6. Interface for cycle documentation.
         7. Multi-component filter system.
         8. Micro-fine filter.
         9. Load Carriers: Direct connection.
         10. Setting options for process chemicals (4 x 5 L or 2 x 5 L + 1 x 10 L).
         11. Heater elements outside wash cabinet.
         12. Simple Load modular basket design.
         13. Wash cabinet made from high-quality stainless steel (1.4404/316 L).
         14. Multicolored chamber lighting.

\*\* NOTE TO SPECIFIER \*\* The remaining features are optional. Delete features not required.

* + - * 1. Steam condenser.
        2. Integrated hot-air drying.
        3. Integrated printer for process documentation.
        4. Base, on wheels.
        5. Drain water cooling.
      1. Connection Options:
         1. Ethernet interface.
         2. Dispenser modules.
         3. USB interface.
         4. Central dispensing.
         5. Peak load cut-out/energy management
    1. Miele Model PLW 8616. Lab washer, electric heating - double door, 35-7/16 inches (900 mm) wide, 12.40 cu ft (351 L) usable capacity.
       1. Heating Type: Electricity, Steam or both (depending on versions).
       2. Pre-Heating: Combi Tank (depending on versions).
       3. Electrical: 3 AC 208V, 60Hz Heater rating: 19.0 KW.
       4. Approval: c MET us.
          1. UL 61010-1:2012-05/ CAN/CSA C22.2 No. 61010-1-12.
          2. UL 61010-2-040 CAN/CSA C22.2 No. 61010-2-040:16.
       5. Front, Back, and Side Panels: Stainless steel.
       6. Loading via load carriers.
       7. Electrical door lock.
       8. Buzzer, acoustic signal at end of program.
       9. Service-friendly design.
       10. Capacity: Per cycle.
           1. 100 mL Bottles: 216.
           2. 200 mL Bottles: 120.
           3. 1000 mL Bottles: 60.
           4. Vials: 588.
       11. Performance Data:
           1. Circulation pump Qmax:
           2. Fixed: Spray Arms: 400 L/min.
           3. Variable: Injectors: 600 L/min.
           4. Wash Cabinet Usable Capacity: 12.40 cu ft (351 L)
           5. Tested Operating Hours: 15,000
           6. Tested Service Life in Wash Cycles: 20,000
       12. Controls:
           1. Program Selection: Full-touch color display.
           2. Programmability: programmable.
           3. Programs: 30.
           4. Free Program Positions: 170.
           5. Program continuation in event of power outage.
           6. Time left display.
           7. Status indication via chamber lighting.
           8. Program sequence indicator.
           9. Selectable display languages.
       13. Water Connection/Drainage:
           1. Cold and hot water.
           2. Fully demineralized water.
           3. Required flow pressure in kPa: 29 to 145 psi (200 to 1,000 kPa).
           4. Maximum Water Hardness; Cold Water/Hot Water: 0.710 gpg (12.14 mg per L).
           5. Dump Valve: 2 inch (50 DN).

\*\* NOTE TO SPECIFIER \*\* Drain pump is optional. Delete if not required.

* + - * 1. Drain Pump (retrofitted during installation). Max Head Height: 3 m.
      1. Compressed Air Connection:
         1. Compressed Air Connection: 1.
         2. Required Air Pressure, Technical, in kPa: 87 to 116 psi (600-800 kPa).
         3. NOTE TO SPECIFIER \*\* Drying unit is optional. Delete if not required.
      2. Drying Unit:
         1. Heating Mode Drying Unit: Electricity
         2. Air Throughput: 250 cfm (147.22 cu m per hour).
         3. Temperature Settings in 1.8 degrees F (1 degree C) Steps: 140 to 239 degrees F (60 to 115 degrees C).
         4. Time Setting in 1 minute Steps: 1 to 240 minutes.
         5. HEPA Filter Class: H14
         6. Filtration Efficiency HEPA Filter per DIN EN 1822: 99.950 percent.
         7. HEPA Filter Service Life: 1,000 hours.
         8. Electric Heater Rating: 8.0 kW.
      3. Dimensions and Weight:
         1. External Net Dimensions (HxWxD): 69-3/4 x 37-1/4 x 34-1/8 inches (1770 x 945 x 865 mm)
         2. External Dimensions Including Plinth/Floor Tray and Top Casing: 98-1/4 inch (2495 mm).
         3. External Gross Dimensions (HxWxD): 77-1/4 x 44-1/2 x 39-3/8 inches (1960 x 1130 x 1000 mm).
         4. Wash Cabinet (HxWxD): 25-5/8 x 26-5/8 x 31-1/2 inches (650 x 675 x 800 mm)
         5. In-Feed Height Above Floor: 33-1/2 inch (850 mm).
         6. Gross Weight: 896 lbs (406 kg). Net Weight: 860 lbs (390 kg).
         7. Maximum Floor Loading in N: 1798 lbf (8000 N).
      4. Programs:
         1. Mini.
         2. Standard.
         3. Universal.
         4. Intensive.
         5. Inorganic.
         6. Organic.
         7. Agar.
         8. Plastics.
         9. Vials.
         10. Pipettes.
         11. Special 93C-10.
         12. Tap Rinse.
         13. DI Rinse.
         14. Drying.
      5. Features:
         1. Two integrated dispenser pumps for liquid. cleaning agent dispensing: 1 x 5L + 1 x 10L.
         2. Additional Integrated Dispenser Pumps: up to max 2 (depending on canister size)
         3. Volumetric dispensing control.
         4. Conductivity monitoring.
         5. Spray arm monitoring.
         6. Interface for cycle documentation.
         7. Multi-component filter system.
         8. Micro-fine filter.
         9. Load Carriers: Direct connection.
         10. Setting options for process chemicals (4 x 5 L or 2 x 5 L + 1 x 10 L).
         11. Heater elements outside wash cabinet.
         12. Simple Load modular basket design.
         13. Wash cabinet made from high-quality stainless steel (1.4404/316 L).
         14. Multicolored chamber lighting.

\*\* NOTE TO SPECIFIER \*\* The remaining features are optional. Delete features not required.

* + - * 1. Steam condenser.
        2. Integrated hot-air drying.
        3. Integrated printer for process documentation.
        4. Base, on wheels.
        5. Drain water cooling.
      1. Connection options:
         1. Ethernet interface.
         2. Dispenser modules.
         3. USB interface.
         4. Central dispensing.
         5. Peak load cut-out/energy management.
    1. Miele Model PLW 8617. Lab washer, electric heating - single door, 45-1/4 inches (1,150 mm) wide, 12.40 cu ft (351 L) usable capacity.
       1. Heating Type: Electricity, Steam or both (depending on versions)
       2. Pre-Heating: Preheated and Recycle Tank, or both (depending on versions)
       3. Electrical: 3 AC 208 V, 60 Hz Heater rating: 19.0 KW
       4. Approval: c MET us
          1. UL 61010-1:2012-05/ CAN/CSA C22.2 No. 61010-1-12
          2. UL 61010-2-040 CAN/CSA C22.2 No. 61010-2-040:16
       5. Front, Back, and Side Panels: Stainless steel.
       6. Loading via load carriers.
       7. Electrical door lock.
       8. Buzzer, acoustic signal at end of program.
       9. Service-friendly design.
       10. Capacity: Per cycle.
           1. 100 mL Bottles: 216
           2. 200 mL Bottles: 120
           3. 1000 mL Bottles: 60
           4. Vials: 588
       11. Performance Data:
           1. Fixed: Spray Arms: 400 L/min
           2. Variable: Injectors: 600 L/min
           3. Wash Cabinet Usable Capacity: 12.40 cu ft (351 L)
           4. Tested Operating Hours: 15,000
           5. Tested Service Life in Wash Cycles: 20,000
       12. Controls:
           1. Program Selection: Full-touch color display.
           2. Programmability: Programmable.
           3. Programs: 30.
           4. Free Program Positions: 170.
           5. Program continuation in event of power outage.
           6. Time left display.
           7. Status indication via chamber lighting.
           8. Program sequence indicator.
           9. Selectable display languages.
       13. Water Connection/Drainage:
           1. Cold and hot water.
           2. Fully demineralized water.
           3. Required Flow Pressure in kPa: 29 to 145 psi (200 to 1,000 kPa).
           4. Maximum Water Hardness; Cold Water/Hot Water: 0.710 gpg (12.14 mg per L).
           5. Dump Valve: 2 inch (50 DN).

\*\* NOTE TO SPECIFIER \*\* Drain pump is optional. Delete if not required.

* + - * 1. Drain Pump (retrofitted during installation). Max Head Height: 3 m
      1. Compressed Air Connection:
         1. Compressed Air Connection: 1.
         2. Required Air Pressure, in kPa: 87 to 116 psi (600-800 kPa).
         3. NOTE TO SPECIFIER \*\* Drying unit is optional. Delete if not required.
      2. Drying unit
         1. Heating Mode: Electricity.
         2. Air Throughput: 250 cfm (147.22 cu m per hour).
         3. Temperature Settings in 1.8 degrees F (1 degree C) Steps: 140 to 239 degrees F (60 to 115 degrees C).
         4. Time Setting in 1 minute Steps: 1 to 240 minutes.
         5. HEPA Filter Class: H14
         6. Filtration Efficiency HEPA Filter per DIN EN 1822: 99.950 percent.
         7. HEPA Filter Service Life: 1,000 hours.
         8. Electric Heater Rating: 8.0 kW.
      3. Dimensions and Weight:
         1. External Net Dimensions (HxWxD): 98-1/4 x 45-3/8 x 39 inches (2495 x 1150 x 990 mm).
         2. External Dimensions Including Plinth/Floor Tray and Top Casing: 98-1/4 inch (2495 mm).
         3. External Gross Dimensions (HxWxD): 81-1/2 x 47-1/4 x 31-1/2 inches (2070 x 1200 x 800 mm).
         4. Wash Cabinet (HxWxD): 26-5/8 x 25-5/8 x 31-1/2 inches (675 x 650 x 800 mm).
         5. In-Feed Height Above Floor: 33-1/2 inch (850 mm).
         6. Gross Weight: 1213 lbs (550 kg). Net Weight: 962 lbs (436 kg).
         7. Maximum Floor Loading in N: 1798 lbf (8000 N).
      4. Programs:
         1. Mini.
         2. Standard.
         3. Universal.
         4. Intensive.
         5. Inorganic.
         6. Organic.
         7. Agar.
         8. Plastics.
         9. Vials.
         10. Pipettes.
         11. Special 93C-10.
         12. Tap Rinse.
         13. DI Rinse.
         14. Drying.
      5. Features:
         1. Two integrated dispenser pumps for liquid cleaning agent dispensing: 1 x 10L + 1 x 10L.
         2. Additional integrated dispenser pumps: up to max 2 (depending on canister size)
         3. Volumetric dispensing control.
         4. Conductivity monitoring.
         5. Spray arm monitoring.
         6. Interface for cycle documentation.
         7. Multi-component filter system.
         8. Micro-fine filter.
         9. Load Carriers: Direct connection.
         10. Setting options for process chemicals (4 x 10 L).
         11. Heater elements outside wash cabinet.
         12. Simple Load modular basket design
         13. Wash cabinet made from high-quality stainless steel (1.4404/316 L)
         14. Multicolored chamber lighting

\*\* NOTE TO SPECIFIER \*\* The remaining features are optional. Delete features not required.

* + - * 1. Steam condenser.
        2. Integrated hot-air drying.
        3. Integrated printer for process documentation.
        4. Base, on wheels.
        5. Drain water cooling.
      1. Connection Options:
         1. Ethernet interface.
         2. Dispenser modules.
         3. USB interface.
         4. Central dispensing.
         5. Peak load cut-out/energy management.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. Coordinate with mechanical and electrical trades for location, size and type of service required.
      3. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions.
      2. Plumbing and electrical work shall be performed by licensed professionals and adhere to Local, State and Federal Codes as applicable.
   4. PROTECTION
      1. Protect installed products until completion of project.
      2. Touch-up, repair or replace damaged products before Substantial Completion.
   5. DEMONSTRATION
      1. Manufacturer to provide a minimum of one hour of instruction on operation and maintenance of the washer.

END OF SECTION