

September 12, 2012

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UL 162A

OUTLINE OF INVESTIGATION
FOR
FIXED WATER-MOTOR COUPLED PUMPS FOR FOAM CONCENTRATE
PROPORTIONING

Issue Number 1

September 12, 2012

Summary of Topics

This is the first issue of the Outline of Investigation for Fixed Water-Motor Coupled Pumps for Foam Concentrate Proportioning, UL 162A.

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INTRODUCTION

1 Scope

1.1 These requirements cover water-motor coupled pumps intended for supplying foam liquid concentrate to fire protection systems. These requirements are based on the premise that the minimum and maximum viscosity of foam liquid concentrate shall be investigated for use with the water-motor coupled pump. Water-motor coupled pumps shall comply with the requirements described herein, in addition to the applicable requirements in the Standard for Foam Equipment and Liquid Concentrates, UL 162, and the applicable requirements in the Outline of Investigation for High-Expansion Foam-Extinguishing System Equipment and Concentrates, SU 139.

1.2 Requirements for the design, installation, operation, testing, and maintenance of foam systems for fire protection are included in the Standard for Low-, Medium-, and High-Expansion Foam, NFPA 11, and the Standard for Installation of Foam-Water Sprinkler and Foam-Water Spray Systems, NFPA 16.

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this Outline of Investigation shall comply with the requirements for that component.

2.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this Outline of Investigation; or
- b) Is superseded by a requirement in this Outline of Investigation.

2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 Undated References

4.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

5 Glossary

5.1 For the purpose of these requirements, the following definitions apply.

5.2 CHECK VALVE – A self-acting device that is designed to allow fluid flow in one direction.

5.3 CHECK VALVE, POPPET-TYPE – A check valve incorporating a disc or plug that moves uniformly away from or towards the valve seat.

5.4 CHECK VALVE, SWING-TYPE – A check valve incorporating a single clapper that rotates about a fixed location.

5.5 CORROSION-RESISTANT MATERIAL – For water exposure, a material having resistance to corrosion equivalent to or exceeding that of a brass or bronze alloy, aluminium oxide or series 300 stainless steel. For foam liquid concentrate exposure, a material having resistance to corrosion equivalent to or exceeding that of a brass or bronze alloy, or series 300 stainless steel.

5.6 DRAIN VALVE, TWO WAY BALL VALVE – A valve used as a shutoff valve for drain purposes incorporating a closure mechanism that consists of a ported sphere installed within the valve body. Rotation of the sphere by 90 degrees changes the position from open to close. These valves are typically provided with a handle type operating mechanism with stationary stops.

5.7 FLEXIBLE DRIVE COUPLING – A device used to connect the shafts from a water motor to a pump that permits minor angular and parallel misalignment while transmitting, at most, the maximum specified torque.

5.8 FOAM LIQUID CONCENTRATE – A concentrated liquid foaming agent that is intended to be diluted with water.

5.9 PRESSURE, MAXIMUM WORKING – For performance tests specified in this standard, the sum of the maximum net pressure developed by the pump and the maximum positive suction pressure marked on the pump, under any condition of intended use including the relief valve discharging 100 percent of the pump capacity with the valve set at its highest pressure setting. For production tests, this value may be lower, based on the conditions imposed by the particular installation for which the pump is constructed. Therefore, the values of maximum net pressure and maximum positive suction pressure that are marked on the pump are those that indicate the acceptability of a pump (the limiting pressures) for an installation.

5.10 PRESSURE, NET (TOTAL HEAD) – The algebraic difference in psi (kPa) between pressures measured at the discharge outlet and at the suction inlet, corrected to the pump centerline and corrected for differences in velocity head at the points of gauge attachment.

5.11 PUMP LOAD – The brake horsepower (kW input) required to drive a pump at rated speed, and at the capacity and net pressure (including the additional requirements associated with the operation of the relief valve) requiring maximum power for its intended use.

5.12 PUMP, POSITIVE DISPLACEMENT – A pump characterized by the use of gears, screws, lobes, cams, plungers, pistons or similar elements to carry and displace foam liquid concentrate. The relationship of shaft speed and liquid flow is linear.

5.13 RELIEF VALVE – A valve capable of automatically relieving 100 percent of pump capacity at a pressure not exceeding 125 percent of the valve set pressure.

5.14 ROTOR – A gear, vane, or similar element used to carry and displace liquid.

5.15 SET PRESSURE – Internal pressure at which the relief valve is intended to start to allow the flow of liquid.

5.16 TRIM VALVE, THREE WAY BALL VALVE – A valve, used as a control valve, incorporating a closure mechanism that consists of a ported sphere installed within the valve body. Rotation of the sphere by 90 degrees changes the position such that one of two inlets is open and the outlet remains open or the sphere changes position such that both inlets are closed. These valves are typically provided with a handle type operating mechanism with stationary stops.

5.17 WATER MOTOR, POSITIVE DISPLACEMENT – A water motor characterized by the use of gears, screws, lobes, cams or similar elements to transfer torque by the flow and displacement of water.

5.18 WATER-MOTOR COUPLED PUMP – A positive displacement water motor installed in the water supply line that is coupled to a positive displacement pump to provide proportioning of foam liquid concentrate.

CONSTRUCTION

6 General

6.1 These requirements are intended to address water-motor coupled pumps; and, where applicable, their integral ancillary devices including piping and valves.

6.2 A casting shall be smooth and free from scale, lumps, cracks, blisters, sand holes, and defects of any nature that may affect the use for which it is intended. A casting shall not be plugged or filled, but may be impregnated to remove porosity.

6.3 A bolt, stud, cap screw, or gland swing bolt used to assemble parts subject to stress due to fluid pressure shall have a nominal diameter of not less than 1/4-inch (6.4 mm).

6.4 An interior bolt or screw that is exposed to foam liquid concentrate shall be a corrosion-resistant material.