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Project 93ME50004

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REPORT

on

COMPONENT - MOTOR OPERATED WATER PUMPS

***** ULKA **COSTRUZIONI ELETTROMECCANICHE SRL**
Pavia, Italy

INDEX

Model	Section	Report Date	USR	CNR
E; Types EP4, EP5, EP7, EX4, EX5, EX7, EN4, EN4FM	1	1993-05-05	X	X
E8; Types EP8, EX8,			X	X
E77; Types EP77 and EX77			X	
EA; Types EAP4, EAP5, EAP7, EAX4, EAX5, EAX7,			X	X
ER; Types EP4R, EX4R, EP8R, EX8R			X	X
E8LT, Types EP8LT, EX8LT			X	X
HF			X	X
HF, Type HF2S, **HF3S**			X	X
EF; Types EFP4, EFP5, EFP7, EFX4, EFX5 and EFX7			X	X
EFM; Types EP4FM, EP5FM, EX4FM EX5FM			X	X
Model E Type EP5BN, EX5BN			X	X
NME: Types 1, 1C, 1S, 2, 2S, 3, 3S, 4, 5 NMEHP: Types 1, 2, 3, 4., NMECC NMEK	2	1998-06-17	X	X

Note: USR - United States Standard, Recognized Component
CSR - Canadian National Standard, Recognized Component

DESCRIPTION

PRODUCT COVERED:

USR, CNR: Component (Not For General Use) – Oscillating type Water Pumps,
Model E, Types EP4, EP5, EP7, EX4, EX5, EX7, EN4 and EN4FM, EP5BN, EX5BN.

Model E8, Type EP8, EX8.

Model EA, Types EAP4, EAP5, EAP7, EAX4, EAX5, and EAX7.

Model ER; Types EP4R, EX4R, EP8R, EX8R

Model E8LT, Types EP8LT, EX8LT

Model HF

Model HF, Type HF2S, **HF3S**

Model EF; Types EFP4, EFP5, EFP7,EFX4, EFX5, EFX7.

Model EFM; Types EP4FM, EP5FM, EX4FM, EX5FM

USR: Component (Not for General Use) – Oscillating type Water Pumps, Model E77, Types EP77, EX77.

ELECTRICAL RATINGS:

Volts	Frequency	Watts	Amps	Model
120 V	60 Hz	41 W		Model E
120 V	60 Hz	60 W	1 A	Model E, Type EN4
120 V	60 Hz	55 W		Model E, Type EN4FM
120 V	60 Hz	52 W		Model EA
220 V	50/60 Hz	64 W		Model EA
120 V	60 Hz	46 W		Model ER
120 V	60 Hz	29 W		Model E8
120 V	60 Hz	23 W		Model E8LT
120 V	60 Hz	27 W		Model E77
120 V	60 Hz	23 W		Model HF
120 V	60 Hz	14 W		Model HF, Type HF2S,
208-240 V	**60 Hz**	**15-21 W**		**Model HF, Type HF3S,**
120 V	60 Hz	52 W		Model EF
120 V	60 Hz	46 W		Model EFM
120 V	60 Hz	52 W		Model E, Type EP5BN, EX5BN

TECHNICAL CONSIDERATIONS (NOT FOR UL REPRESENTATIVE USE):

General - The products covered by this Report are one-way solenoid type oscillating water pumps. The oscillating action of the pump piston is accomplished by using the pumps inherent diode and half-wave rectifying the supply voltage in the end product.

USR indicates evaluation to U.S. Standard for “Motor-Operated Water Pumps”, UL 778.

CNR indicates evaluation to Canadian Standard for “Liquid Pumps”, CSA C22.2 No. 108-01.

Conditions of Acceptability - For use only in (or with) complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

In determining the acceptability of these pumps, the following shall be determined in the end-use application:

1. The pump and quick connect terminals must be provided with a suitable enclosure in accordance with the requirements of the end-use Standard.

2. The quick connect terminals are not suitable for field wiring purposes.

3. The suitability of the Model E ER and EP5BN, EX5BN pumps for a duty cycle other than 1 min ON/1 min OFF, and at an ambient greater than room temperature, must be evaluated in the end product. The suitability of the Model HF, EF and EFM pumps for a duty cycle other than 2 min ON/1 min OFF, and at an ambient greater than room temperature, must be evaluated in the end product

4. The suitability of the Model EA, 120 V for a duty cycle other than 1 min on/1.5 min off, the Model EA 220 V for duty cycle other than 1 min on/2 min off and at an ambient greater than room temperature, must be evaluated in the end product.

5. Models E8LT, E77, E8 and HF2S were tested for continuous operation. **Model HF3S were tested for a duty cycle of 50 sec ON, 600 sec. OFF**

6. The suitability of the pump for control of a water source greater than atmospheric pressure, or at a water temperature greater than 25°C, must be evaluated in the end product, except for Model E, Type EN4, EN4FM, and HF2S pump which is rated for use with water 35 °C. **and for the model HF3S which is rated for use with water and ambient at 65°C.**

7. Temperatures of the coil windings are to be monitored in the end product by the change-of-resistance method, and are not to exceed the limits for the insulation class, as follows:

Model Series	Insulation Class	Max. Coil Winding Temperature, °C
E, E77	A	105°C
E (Type EN4, EN4FM only)	H	165°C
EA	A	105°C
E8	F	150°C
ER	F	150°C
E8LT	F	150°C
HF	F	150°C
HF (Type HF2S, **HF3S)**	F	150°C
EF	F	150°C
EFM	F	150°C
Model E, type EP5/BN, EX5BN	F	150°C

8. The suitability of the permanence of markings shall be determined in the end product.

9. The suitability of the Diode, when not provided by the manufacturer, shall be determined in the end product.

10. The need for grounding or bonding of dead metal shall be determined in the end product.

11. If external forces are applied on the surface of the employed thermal link that are likely to affect the operation of the thermal –link, an additional crush test shall be considered in the end product.

12. The case of thermal-fuse mounted on Model E, Type EN4 **and EN4FM** is an uninsulated live part. Distances with uninsulated thermal fuse needs to be verified in the end-use.

CONSTRUCTION DETAILS:

General – For details of construction, reference should be made to the following photographs and their accompanying descriptions. The general design, shape, and arrangement shall be as depicted unless otherwise specified.

Dimensions – All dimensions are approximate unless designated as max or min.

Corrosion Protection – All ferrous metal parts of the frame and enclosure are suitably protected against corrosion by plating, painting, or the equivalent.

Spacings – A minimum spacing of 6.4 mm shall be maintained over surfaces of insulating materials. A minimum spacing of 2.4 mm shall be maintained through air between uninsulated live parts of opposite polarity on the coil and between uninsulated live parts and dead-metal parts.

Mechanical Assembly – All electrical components are rigidly secured by screws, bolts, rivets, or a combination of bolts and lockwashers, so as to prevent rotation about their mounting axis. All metal edges are free from burrs and sharpness.

MARKINGS:

Markings – Recognized Company's name, model and type number, electrical ratings, duty cycle, date code, the statement "Water Only Max 25°C" or "Water Only Max 35°C" (for model E, Type EN4, EN4FM only) or the equivalent. See below table for duty cycle information:

Model	V	Duty cycle On/Off
E, ER	120	1 min/1 min
E, Type EN4FM	120	1 min/1.5 min
E8LT, E77, E8, HF (Type HF2S)	120	Continuous operation
EA	120	1 min/1.5 min
EA	220	1 min/2 min
HF, EF, EFM Model E, Type EP5BN, EX5BN	120 120	2 min/1 min 1 min/1 min

Manufacturing Date Code (dd/mm/yy) – Optional. Consists of six digits, first two representing day, second two representing month and the last two representing year.

Example: 02/07/92 = 2nd July 1992.

MODEL DIFFERENCES:

The pumps Models E, EA, ER, E8, E77, EF, EFM and E8LT have similar construction except for the following:

In the Type reference the number 1 to 8 represents different performances (diameter of the plunger) the letter “P” represents pumps with polymeric outlet and the letter “X” represents pumps with brass outlet.

Model E has two alternate constructions.

Model EA is identical to Model E except for winding and duty cycles

Model EF is identical to Model E except for Solenoid Coil (class F insulation system) and duty cycle.

Type EP77 has a plastic outlet fitting, 900 ccm/min, 4.2 bar max.
Type EX77 has a brass outlet fitting, 900 ccm/min, 4.2 bar max.

Model E, Type EN4 is similar to Model EFP4 except for winding, diode and addition of thermal fuse.

Model HF, Type HF2S is identical to Model HF except for winding, and electrical rating.

LOCATION

570417 (Party Site)
(867811-001) CEME S.p.A. a Socio Unico
Via dell'Industria, 5
27020 Trivolzio PV ITALY
Factory ID: T
UL Contracting Party for above site is: UL GmbH

575887 (Party Site)
(100533-359) CEME ZHONGSHAN CO LTD
INDUSTRIAL RD 38
XIAOLAN TOWN
ZHONGSHAN
GUANGDONG 528415 CHINA
Factory ID: C
UL Contracting Party for above site is: UL GmbH