

Contents

Page

Foreword	v
4 Sealless, magnetically driven rotary pumps	1
4.0 Scope	1
4.1 Types and nomenclature	1
4.1.1 Objective	1
4.1.2 Introduction	1
4.1.3 Types of magnetic drive configurations	1
4.2 Definitions	7
4.2.1 Close coupled	7
4.2.2 Coercive force	7
4.2.3 Containment shell	8
4.2.4 Cooling liquid flow path	8
4.2.5 Curie temperature	8
4.2.6 Decoupling	8
4.2.7 Demagnetization	8
4.2.8 Dephase	8
4.2.9 Eddy current	8
4.2.10 Eddy current drive	8
4.2.11 Eddy current losses	8
4.2.12 Encapsulation	8
4.2.13 Flux	8
4.2.14 Flux density	9
4.2.15 Gap	9
4.2.16 Gauss	9
4.2.17 Gilbert	9
4.2.18 Hydraulic parasitic losses	9
4.2.19 Hydrostatic test pressure	9
4.2.20 Hysteresis	9
4.2.21 Inner magnet assembly (driven)	9
4.2.22 Intrinsic induction	9
4.2.23 Magnet (permanent)	10
4.2.24 Magnetic coupling	10
4.2.25 Magnetic drive pump/magnetic coupling pump	10
4.2.26 Magnetic materials	10
4.2.27 Maximum working pressure	10
4.2.28 Maxwell	10
4.2.29 Negative thrust	10
4.2.30 Oersted	11
4.2.31 Outer magnetic assembly (driver)	11
4.2.32 Permeability (magnetic)	11
4.2.33 Permeance	11
4.2.34 Pole	11
4.2.35 Positive thrust	11
4.2.36 Reluctance (R)	11
4.2.37 Secondary containment	11
4.2.38 Secondary containment system	11
4.2.39 Secondary control	11
4.2.40 Secondary control system	11

4.2.41	Separately coupled	12
4.2.42	Shell	12
4.2.43	Slip, hydraulic	12
4.2.44	Slip, magnetic	12
4.2.45	Synchronous drive	12
4.3	Design and application	12
4.3.1	Scope	12
4.3.2	Sealless pump overview	13
4.3.3	Application considerations	14
4.3.4	Life cycle cost evaluation	19
4.3.5	Selection guideline	20
4.3.6	Supplemental data sheet	21
4.4	Installation, operation, and maintenance	21
4.4.1	Installation	21
4.4.2	Operation	23
4.4.3	Maintenance	25
4.5	Reference and source material	26
4.5.1	Hydraulic Institute	26
4.5.2	Motor & Motion Association (SMMA)	26
4.6	Test	26
4.6.1	Hermetic integrity test (optional)	27
4.6.2	Torque confirmation test (optional)	28
Appendix A	Index	30
Figures		
4.1.3a	— Close-coupled, vane-type, magnetic drive pump	2
4.1.3b	— Separately coupled, internal gear, magnetic drive pump with secondary control.	3
4.1.3c	— Separately coupled, screw-type, magnetic drive pump	4
4.1.3d	— Close-coupled, gear-type, magnetic drive pump	5
4.3.6	— Supplemental data sheet	22
Tables		
4.1.3	— Nomenclature	6