

SPICE Model of 3-Phase AC Motor

等価回路モデルでのご提供で下記の3項目に対して、再現性があります。

- (1)周波数特性(インピーダンス特性)
- (2)逆起電力特性
- (3)物理的特性

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1) Parameters Settings

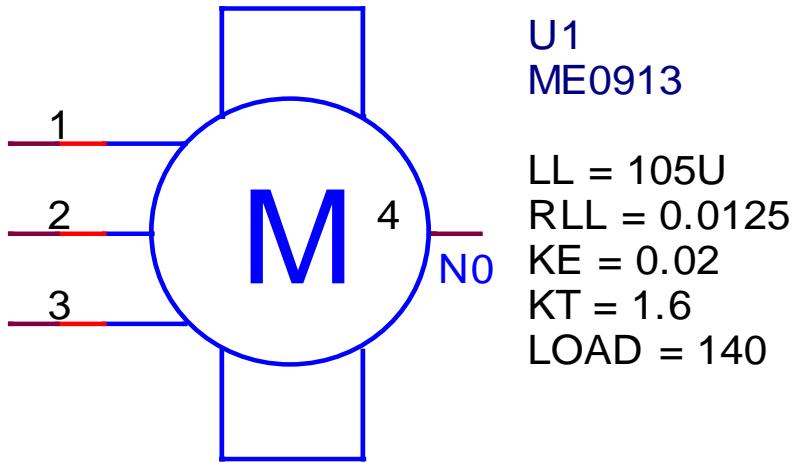


Fig.1 Symbol of 3-Phase Induction Motor

Model Parameters:

LOAD : Load current each phase of motor [Arms]

- e.g. LL = 125Arms, 140Arms, or 400Arms

LL : Phase inductance [H]

- e.g. LL = 10mH, 100mH, or 1H

RLL : Phase resistance (Phase-to-phase) [Ω]

- e.g. RLL = 10m Ω , 100m Ω , or 1 Ω

KE : Back-EMF constant [V/RPM]

- e.g. KE= 0.01, 0.05, or 0.1

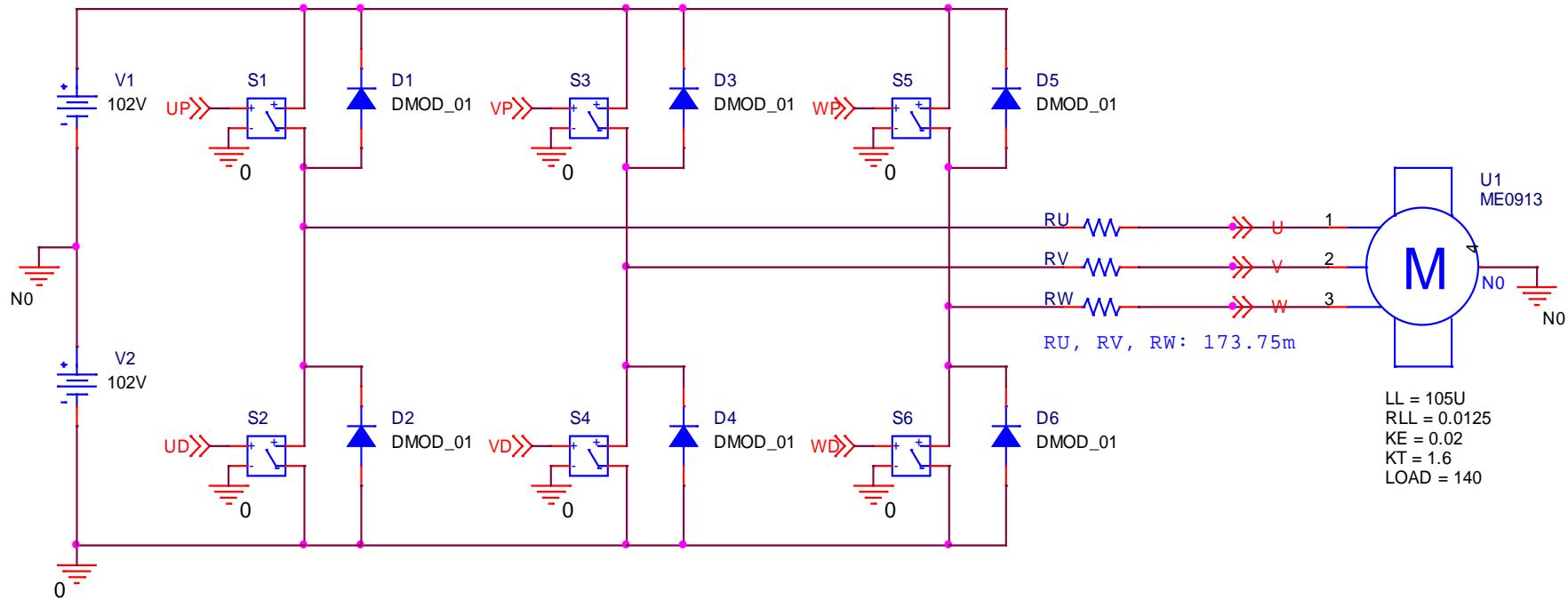
KT : Torque constant [Lb-in/A]

- e.g. KT= 0.1, 0.5, or 1

$\times 1 \text{ Pound Inch equals } 0.11 \text{ Nm}$

- From the 3-Phase Induction Motor specification, the model is characterized by setting parameters LL, RLL, KE, KT and LOAD.

2) Simulation Circuit of 3-Phase AC Motor Model



- Fig.2 Analysis of motor operation powered by alternating voltage variation involves using the model of three-phase induction motor.

Q1-Q6: IGBT,MOSFET and so on

2.1) Phase Current Characteristics Under Load Variation - Simulation Results

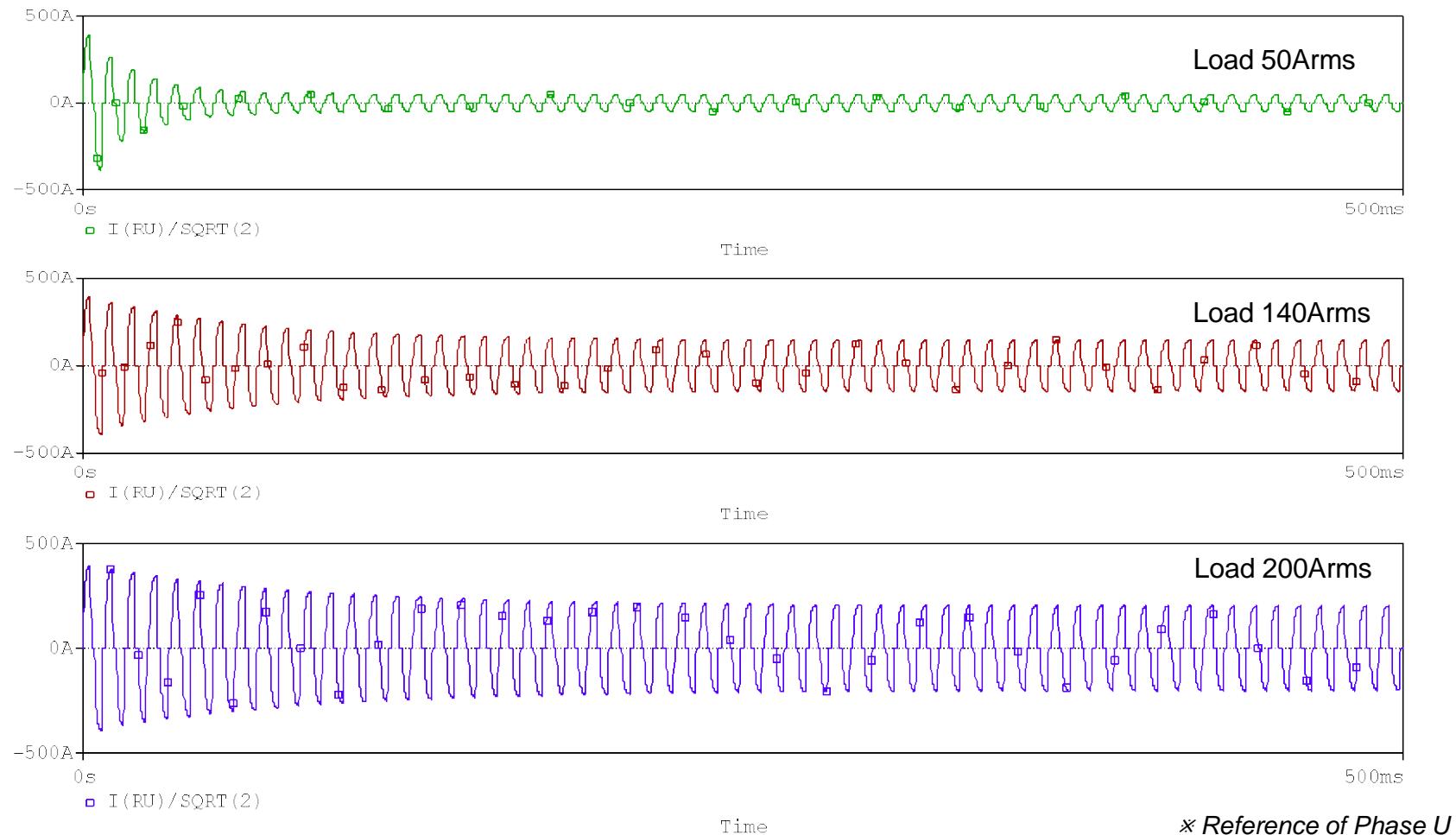


Fig. 3 Current Characteristics under load Condition

2.2) Back-EMF Characteristics Under Load Condition - Simulation Results

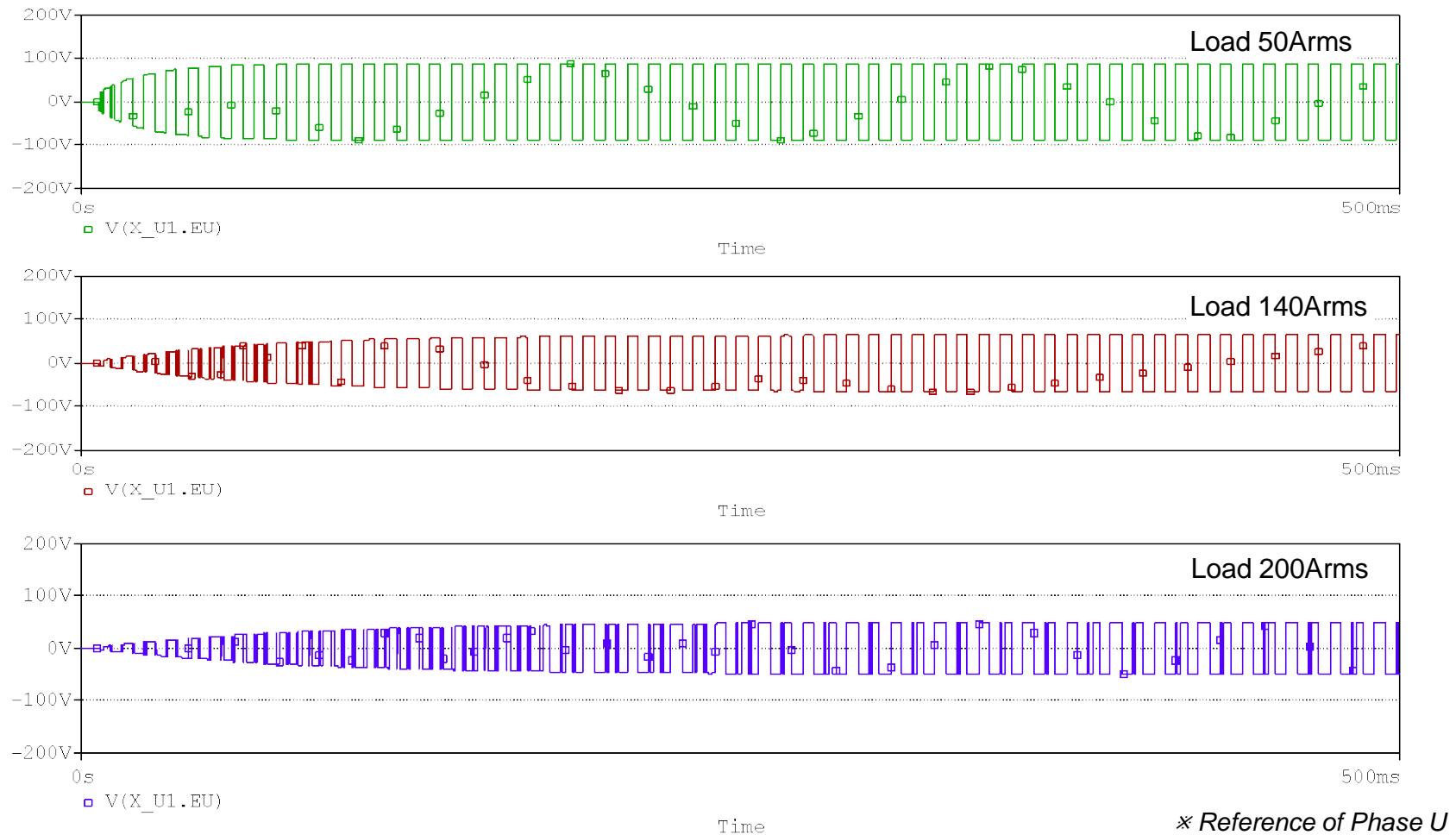


Fig. 4 Back-EMF Characteristics under load Condition

2.3) Speed and Torque Characteristics At 140Arms - Simulation Results

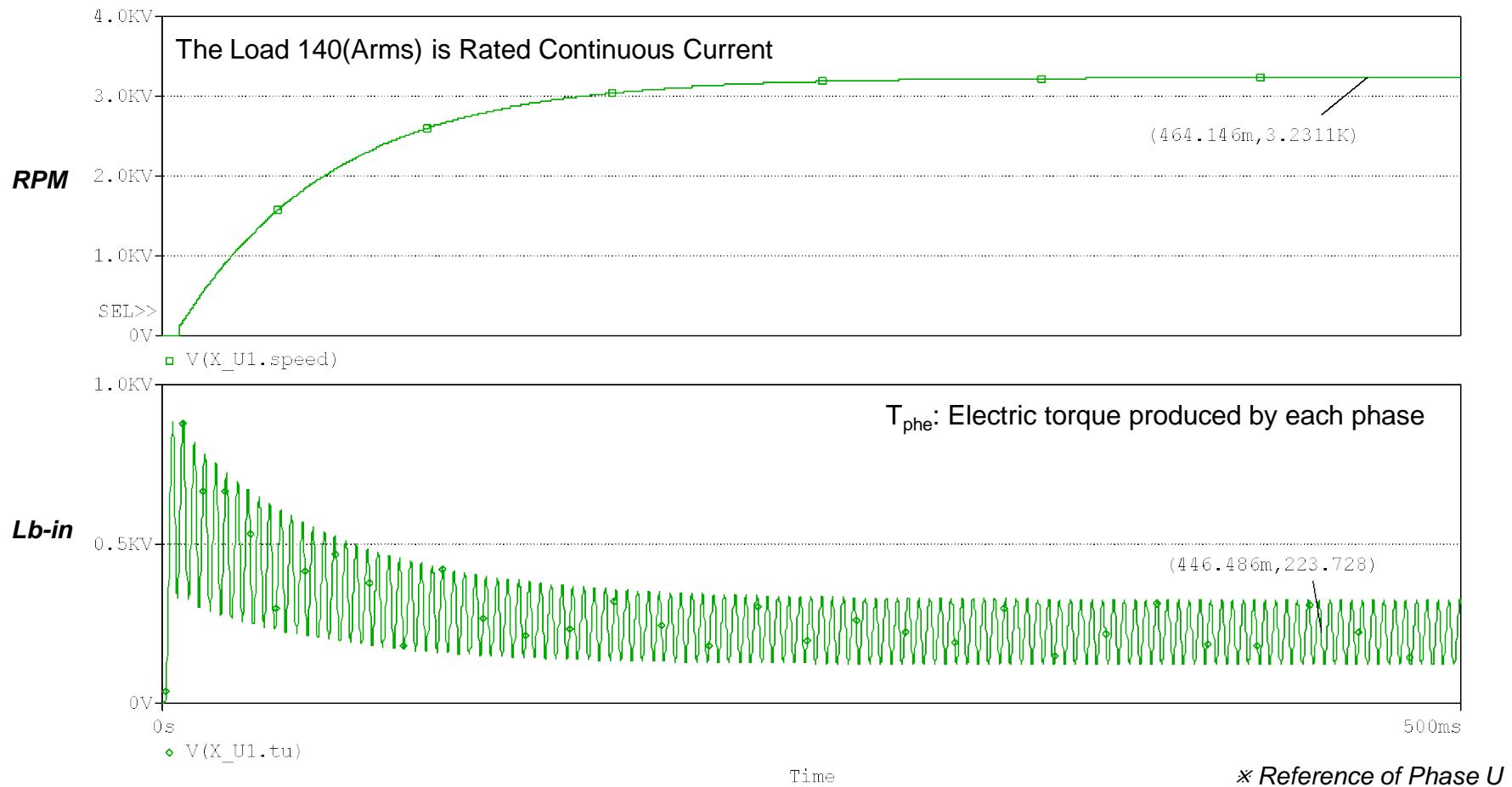


Fig. 5 Speed and Torque Characteristics at Load=140Arms

2.4) Power Output and Efficiency Characteristics At 140Arms - Simulation Results

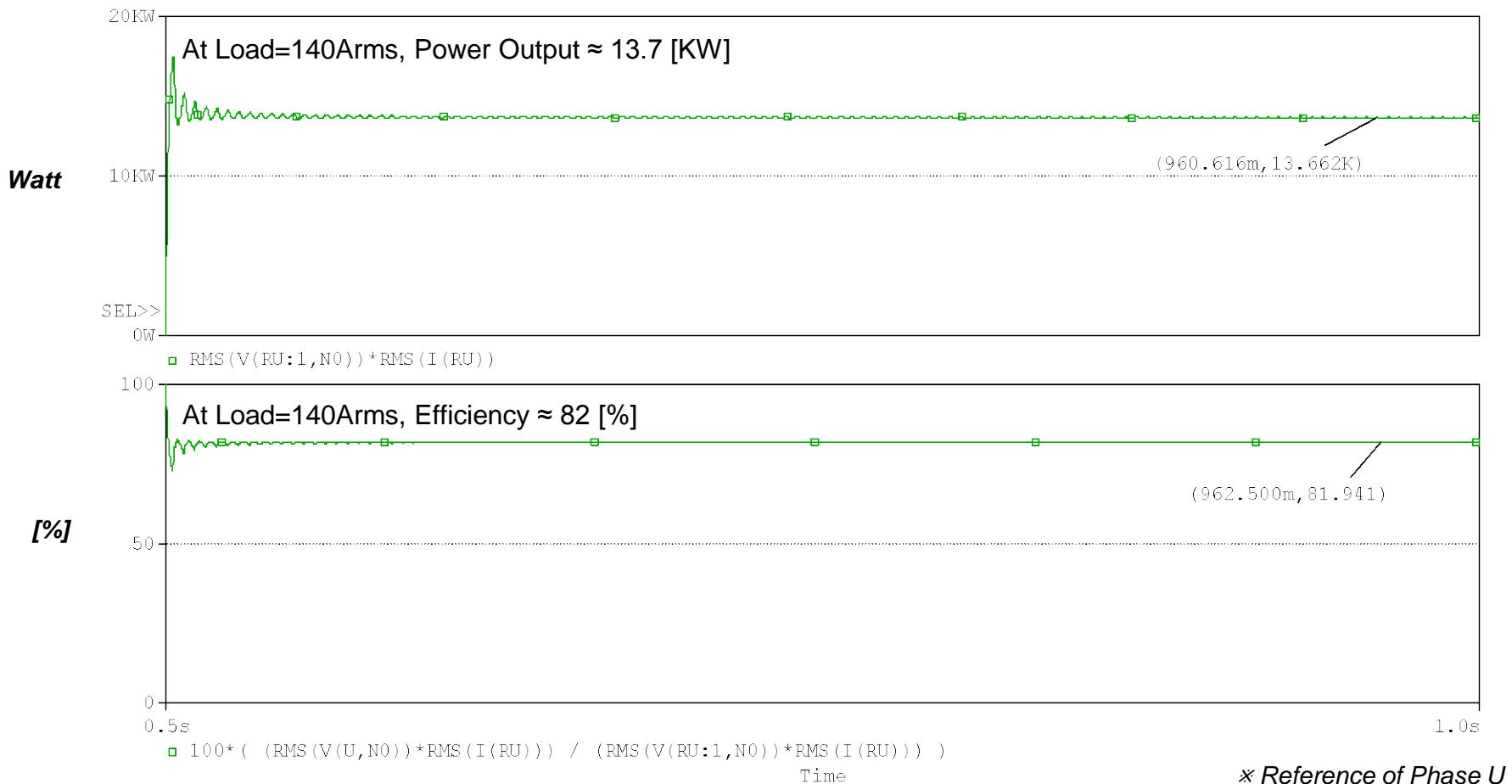


Fig. 6 Power Output and Efficiency Characteristics at Load=140Arms

Appendix A: Measured Point of Simulation Circuit

Simple Circuit of 3-Phase Induction Motor Control System

