

# DATA SHEET

## Three Phase Induction Motor - Squirrel Cage



Customer : QUANTUM CONTROLS

Product line : W22 - IE3 Premium Efficiency Multivoltage Product code : 15836255

Frame	: 225S/M	Cooling method	: IC411 - TEFC
Insulation class	: F	Mounting	: B3T
Duty cycle	: S1	Rotation <sup>1</sup>	: Both
Ambient temperature	: -20 °C to +40 °C	Starting method	: Direct On Line
Altitude	: 1000 m.a.s.l	Approx. weight <sup>3</sup>	: 400 kg
Protection degree	: IP55	Moment of inertia (J)	: 0.6733 kgm <sup>2</sup>
Design	: N		

Output	45 kW	45 kW	45 kW
Poles	4	4	4
Frequency	50 Hz	50 Hz	50 Hz
Rated voltage	380/660 V	400/690 V	415 V
Rated current	86.4/49.7 A	83.9/48.6 A	82.9 A
L. R. Amperes	579/333 A	629/365 A	655 A
LRC	6.7	7.5	7.9
No load current	33.0/19.0 A	35.0/20.3 A	38.0 A
Rated speed	1475 rpm	1480 rpm	1480 rpm
Slip	1.67 %	1.33 %	1.33 %
Rated torque	292 Nm	291 Nm	291 Nm
Locked rotor torque	240 %	280 %	300 %
Pull up torque	200 %	235 %	255 %
Breakdown torque	280 %	310 %	340 %
Service factor	1.00	1.00	1.00
Noise level <sup>2</sup>	63.0 dB(A)	63.0 dB(A)	63.0 dB(A)
Locked rotor time (hot)	18 s	17 s	16 s
Locked rotor time (cold)	32 s	31 s	29 s
Efficiency (%)	50%	93.8	93.7
	75%	94.0	94.1
	100%	94.2	94.4
Power Factor	50%	0.72	0.66
	75%	0.81	0.77
	100%	0.84	0.80

Bearing type	Drive end	Non drive end	Foundation loads
	6314-C3	6314-C3	
Lubrication interval	14000 h	14000 h	Max. compression : 13060 N
Lubricant amount	27 g	27 g	Load type :-
Lubricant type	MOBIL POLYREX EM		Load torque :-
			Load inertia (J=GD <sup>2</sup> /4) :-

Notes  
See notes on page 2.

This revision replaces and cancel the previous one, which must be eliminated.

- (1) Looking the motor from the shaft end.
- (2) Measured at 1m and with tolerance of +3dB(A).
- (3) Approximate weight, subject to be changed after manufacturing process.
- (4) At 100% of full load.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in IEC 60034-1.

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### Thermal protection

ID	Application	Type	Quantity	Sensing Temperature
1	Winding	Thermistor - 2 wires	1 x Phase	155°C

Space heater information  
Voltage: 110-127/200-240 V  
Output: 46-62/46-66 W

### Notes

Standards	Specification	: IEC 60034-1	Vibration	: IEC 60034-14
	Test	: IEC 60034-2	Tolerance	: IEC 60034-1
	Noise	: IEC 60034-9		

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# THERMAL LIMIT CURVE

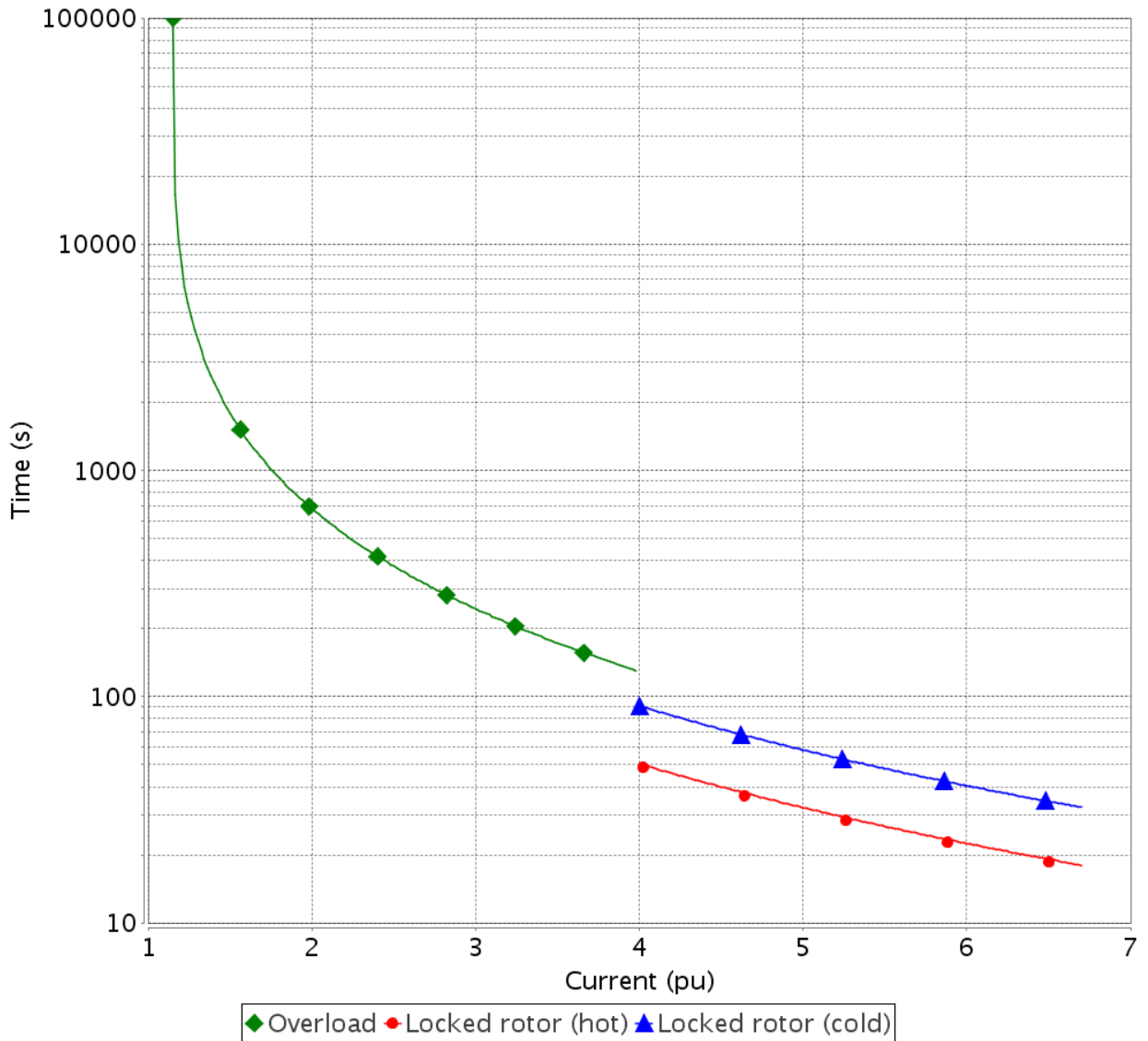
## Three Phase Induction Motor - Squirrel Cage



Customer : QUANTUM CONTROLS

Product line : W22 - IE3 Premium Efficiency Multivoltage

Product code : 15836255



Performance : 45 kW 380/660 V 50 Hz 4P 225S/M

Rated current : 86.4/49.7 A  
 LRC : 6.7  
 Rated torque : 292 Nm  
 Locked rotor torque : 240 %  
 Breakdown torque : 280 %  
 Rated speed : 1475 rpm

Moment of inertia (J) : 0.6733 kgm<sup>2</sup>  
 Duty cycle : S1  
 Insulation class : F  
 Service factor : 1.00  
 Temperature rise : 80 K  
 Design : N

Heating constant : 32.7 min  
 Cooling constant : 98.1 min

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# LOAD PERFORMANCE CURVE

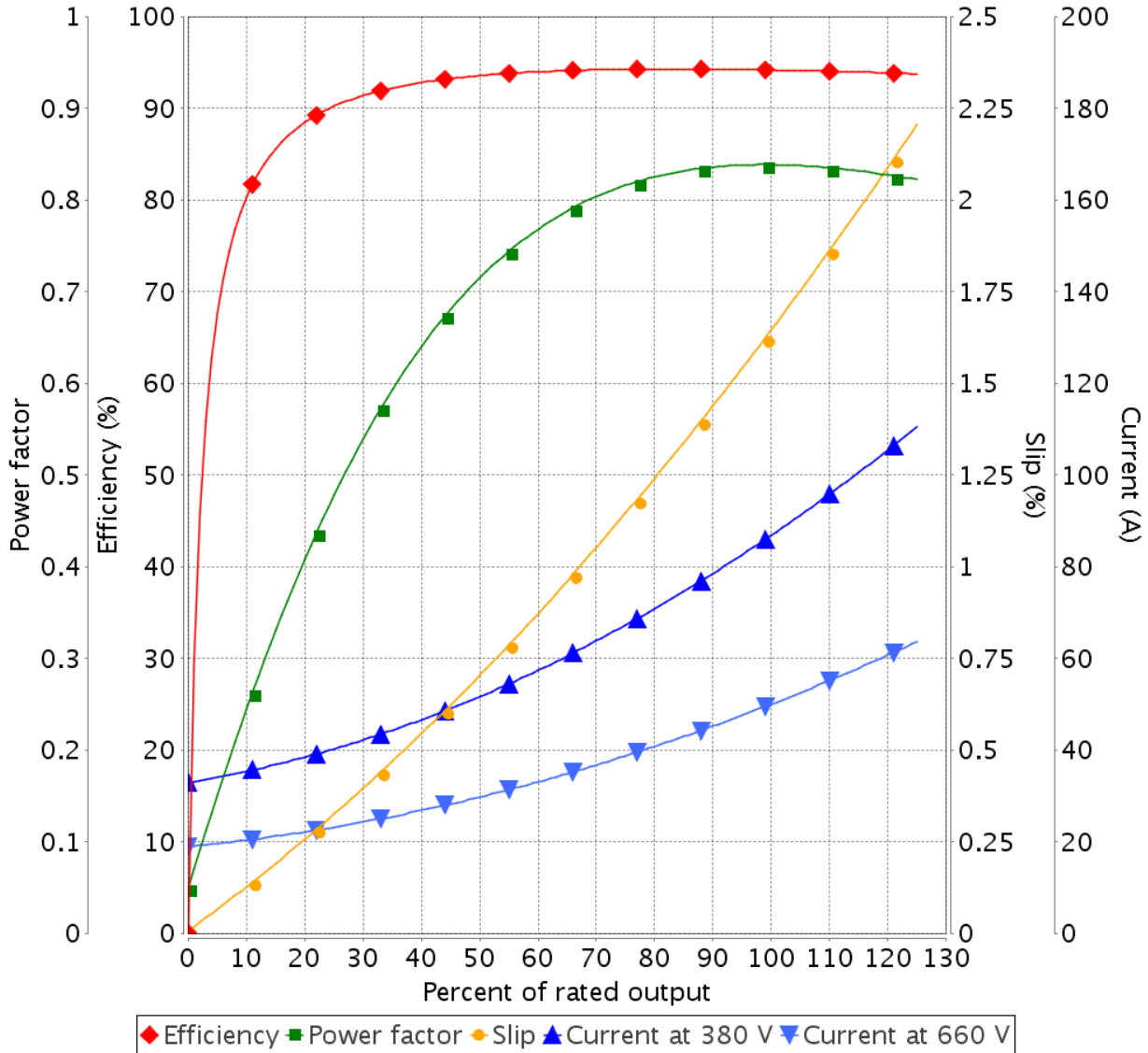
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# VFD OPERATION CURVE

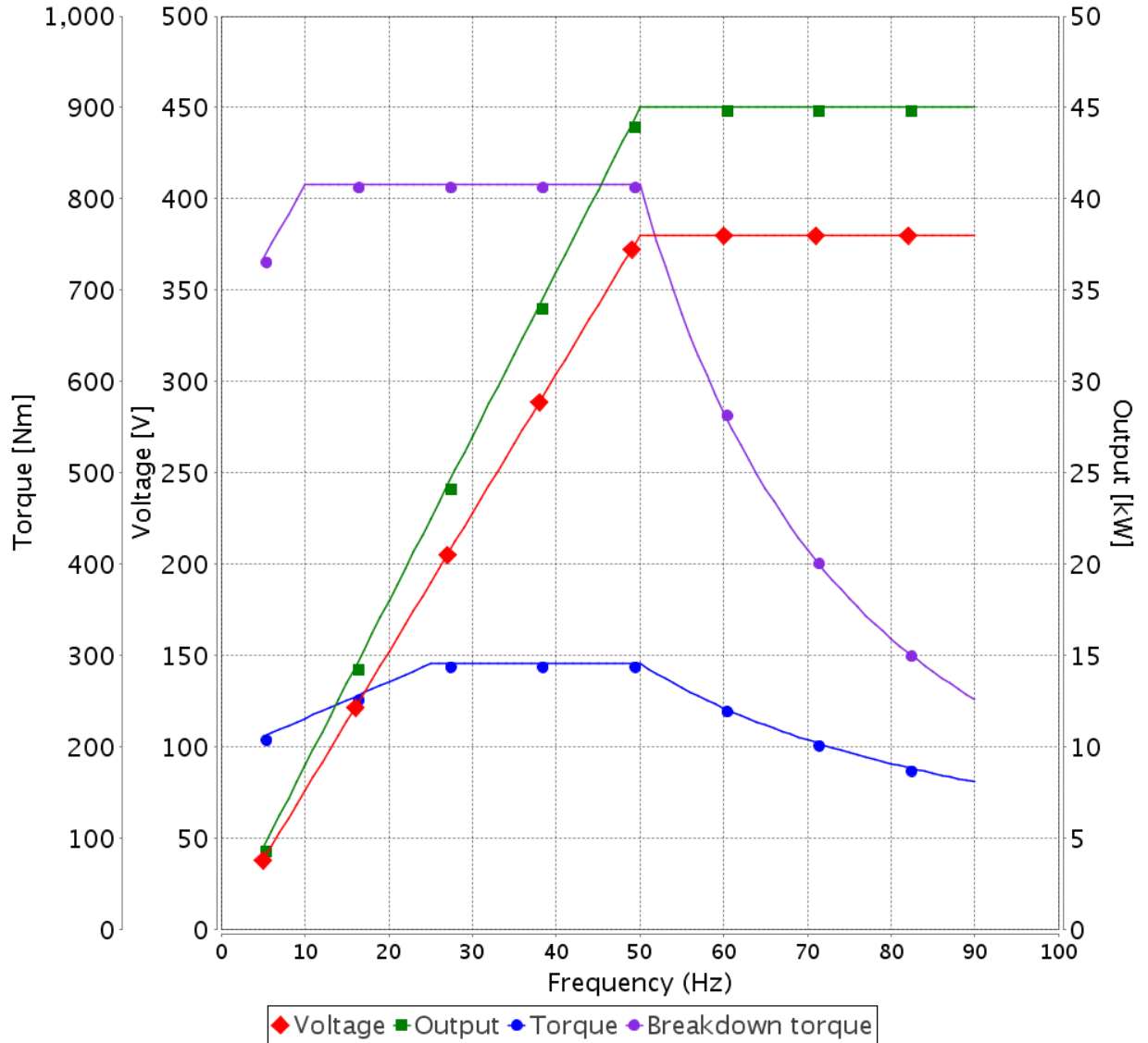
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 Duty cycle : S1  
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 Temperature rise : 80 K  
 Design : N

Voltage Peak Phase-Phase = 1600.0  
 dV/dt = 5200.0  
 Rise time = 0.1

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# TORQUE AND CURRENT VS SPEED CURVE

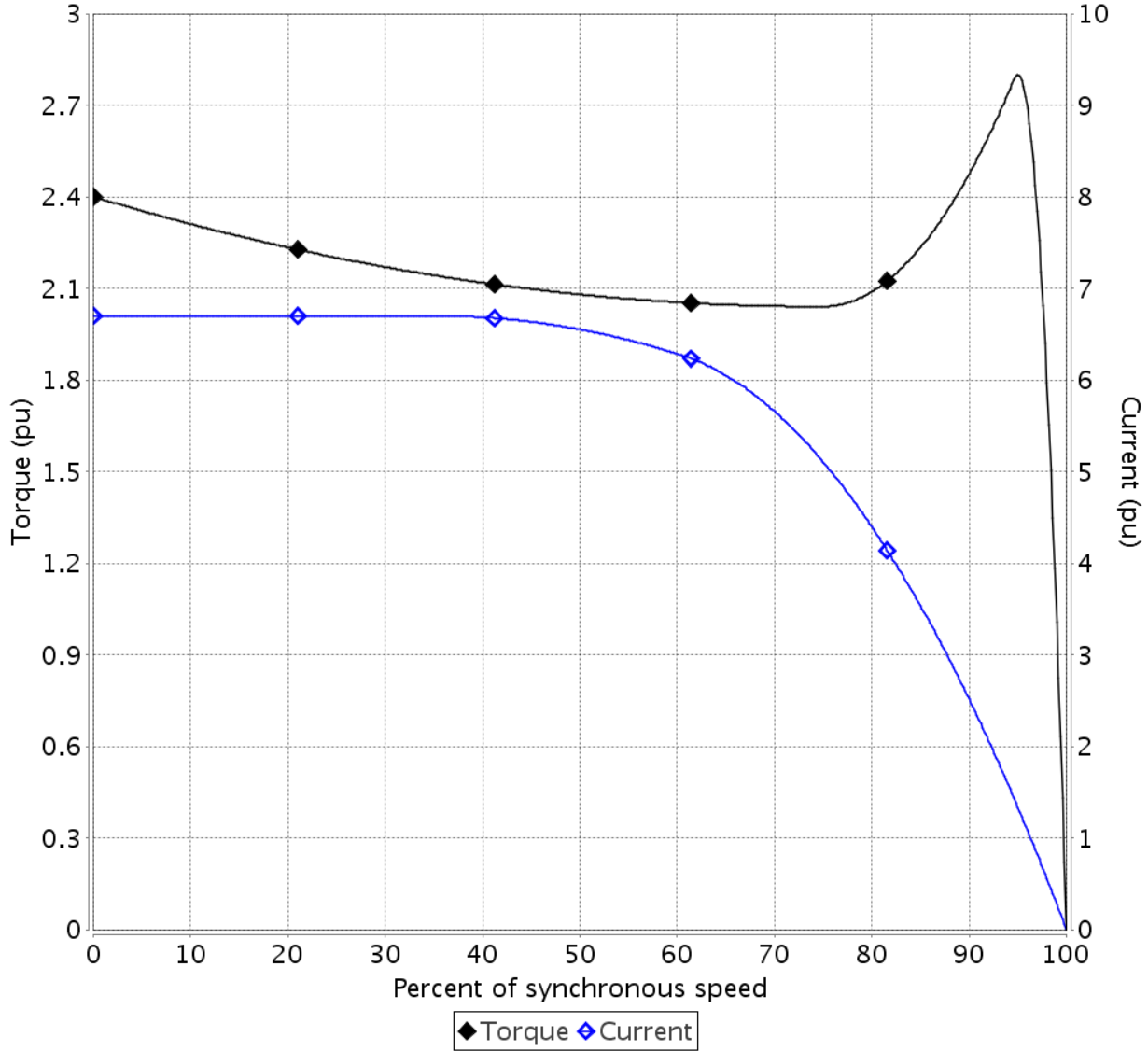
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Rated torque : 292 Nm

Insulation class : F

Locked rotor torque : 240 %

Service factor : 1.00

Breakdown torque : 280 %

Temperature rise : 80 K

Rated speed : 1475 rpm

Design : N

Locked rotor time 100% : 18 s (hot) 32 s (cold)

Load inertia (J=GD<sup>2</sup>/4) : 0.6733 kgm<sup>2</sup>

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# EQUIVALENT CIRCUIT

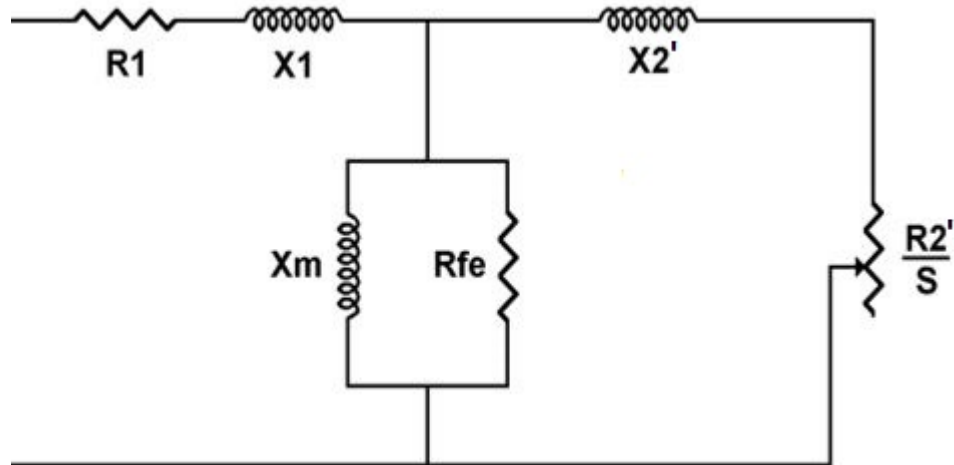
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Rated			
<b>R1</b>	0.1257 omhs / 0.0004 p.u.	<b>X1</b>	0.5966 omhs / 0.0019 p.u.
<b>R2'</b>	0.0835 omhs / 0.0003 p.u.	<b>X2'</b>	0.8113 omhs / 0.0025 p.u.
<b>Rfe</b>	672.1350 omhs / 2.0946 p.u.	<b>Xm</b>	16.9706 omhs / 0.0529 p.u.

Locked rotor			
<b>R1</b>	0.1416 omhs / 0.0004 p.u.	<b>X1</b>	0.4774 omhs / 0.0015 p.u.
<b>R2'</b>	0.2738 omhs / 0.0009 p.u.	<b>X2'</b>	0.4567 omhs / 0.0014 p.u.
<b>Rfe</b>	524.0691 omhs / 1.6332 p.u.	<b>Xm</b>	19.5861 omhs / 0.0610 p.u.

<b>T"do</b>	0.5099 s	<b>X/R</b>	5.0654 p.u.
<b>T"d</b>	0.0271 s	<b>RS</b>	0.0336 omhs / 0.0001 p.u.
<b>Ta</b>	0.0161 s	<b>X"d = Xs</b>	0.9341 omhs / 0.0029 p.u.
<b>Zbase</b>	320.8889 omhs	<b>X2(-)</b>	0.6431 omhs / 0.0020 p.u.

All parameters reflected to stator side.  
 Per phase values, for T connection.  
 Resistances at 20.0 °C, reactances at rated voltage and frequency.

R1	: Stator resistance	T"do	: Open circuit AC time constant
R2'	: Rotor resistance	T'd	: Short circuit AC time constant
Rfe	: Core loss resistance	Ta	: Short circuit DC time constant
X1	: Stator leakage reactance	X/R	: X/R ratio
X2'	: Rotor leakage reactance	RS	: Supplementary losses resistance
Xm	: Magnetizing reactance	X"d = Xs	: Subtransient reactance
Zbase	: Base impedance	X2(-)	: Negative sequence reactance

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