

DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase Product code : 11431398
 Catalog # : 06012ST3QIE404T-W22

| | |
|--------------------------------------|---|
| Frame : 404/5T | Cooling method : IC411 - TEFC |
| Insulation class : F | Mounting : F-1 |
| Duty cycle : Cont.(S1) | Rotation ¹ : Both (CW and CCW) |
| Ambient temperature : -20°C to +40°C | Starting method : Direct On Line |
| Altitude : 1000 m.a.s.l. | Approx. weight ² : 539 kg |
| Protection degree : IP56 | Moment of inertia (J) : 1.55 kgm ² |
| Design : B | |

| | | | | | | | |
|--------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Output [HP] | 60 | 50 | 50 | 50 | 60 | 60 | 60 |
| Poles | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Frequency [Hz] | 60 | 50 | 50 | 50 | 50 | 50 | 50 |
| Rated voltage [V] | 460 | 380 | 400 | 415 | 380 | 400 | 415 |
| Rated current [A] | 69.5 | 70.1 | 67.3 | 64.8 | 85.1 | 80.3 | 78.3 |
| L. R. Amperes [A] | 452 | 421 | 444 | 467 | 426 | 442 | 470 |
| LRC [A] | 6.5x(Code G) | 6.0x(Code F) | 6.6x(Code G) | 7.2x(Code H) | 5.0x(Code E) | 5.5x(Code F) | 6.0x(Code G) |
| No load current [A] | 23.0 | 23.0 | 24.0 | 25.0 | 23.0 | 24.0 | 25.0 |
| Rated speed [RPM] | 1185 | 985 | 985 | 985 | 975 | 980 | 985 |
| Slip [%] | 1.25 | 1.50 | 1.50 | 1.50 | 2.50 | 2.00 | 1.50 |
| Rated torque [kgfm] | 36.7 | 36.8 | 36.8 | 36.8 | 44.7 | 44.4 | 44.2 |
| Locked rotor torque [%] | 200 | 180 | 220 | 229 | 150 | 180 | 190 |
| Breakdown torque [%] | 229 | 220 | 240 | 260 | 180 | 200 | 220 |
| Service factor | 1.25 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Temperature rise | 80 K | 80 K | 80 K | 80 K | 105 K | 80 K | 80 K |
| Locked rotor time | 36s (cold) 20s (hot) | 28s (cold) 16s (hot) | 28s (cold) 16s (hot) | 28s (cold) 16s (hot) | 28s (cold) 16s (hot) | 28s (cold) 16s (hot) | 28s (cold) 16s (hot) |
| Noise level ² | 68.0 dB(A) | 64.0 dB(A) | 64.0 dB(A) | 64.0 dB(A) | 64.0 dB(A) | 64.0 dB(A) | 64.0 dB(A) |
| Efficiency (%) | 25% | | | | | | |
| | 50% | 94.1 | 93.3 | 93.3 | 93.3 | 93.6 | 93.6 |
| | 75% | 94.5 | 93.4 | 93.7 | 93.7 | 93.0 | 93.6 |
| | 100% | 94.5 | 93.3 | 93.4 | 93.4 | 92.4 | 93.0 |
| Power Factor | 25% | | | | | | |
| | 50% | 0.74 | 0.73 | 0.70 | 0.67 | 0.79 | 0.77 |
| | 75% | 0.82 | 0.83 | 0.82 | 0.79 | 0.85 | 0.84 |
| | 100% | 0.86 | 0.86 | 0.85 | 0.85 | 0.87 | 0.87 |

Losses at normative operating points (speed;torque), in percentage of rated output power

| | | | | | | | | |
|------------|----------------|-----|-----|-----|-----|-----|-----|-----|
| Losses (%) | P1 (0,9;1,0) | 6.3 | 7.8 | 7.7 | 7.7 | 9.0 | 8.2 | 8.2 |
| | P2 (0,5;1,0) | 5.0 | 6.4 | 6.3 | 6.3 | 7.6 | 6.8 | 6.8 |
| | P3 (0,25;1,0) | 4.5 | 5.9 | 5.8 | 5.8 | 7.0 | 6.3 | 6.3 |
| | P4 (0,9;0,5) | 3.5 | 4.2 | 4.1 | 4.1 | 4.7 | 4.4 | 4.4 |
| | P5 (0,5;0,5) | 2.3 | 2.9 | 2.8 | 2.8 | 3.3 | 3.0 | 3.0 |
| | P6 (0,5;0,25) | 1.7 | 2.1 | 2.1 | 2.1 | 2.4 | 2.2 | 2.2 |
| | P7 (0,25;0,25) | 1.1 | 1.4 | 1.4 | 1.4 | 1.6 | 1.5 | 1.5 |

| | | | |
|------------------------|------------------|----------------------|-----------------------------|
| | <u>Drive end</u> | <u>Non drive end</u> | Foundation loads |
| Bearing type : | 6316 C3 | 6314 C3 | Max. traction : 688 kgf |
| Sealing : | Inpro/Seal | Inpro/Seal | Max. compression : 1227 kgf |
| Lubrication interval : | 16000 h | 17000 h | |
| Lubricant amount : | 34 g | 27 g | |
| Lubricant type : | Mobil Polyrex EM | | |

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Notes

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 changes 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 NEMA MG-1.

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TORQUE AND CURRENT VS SPEED CURVE



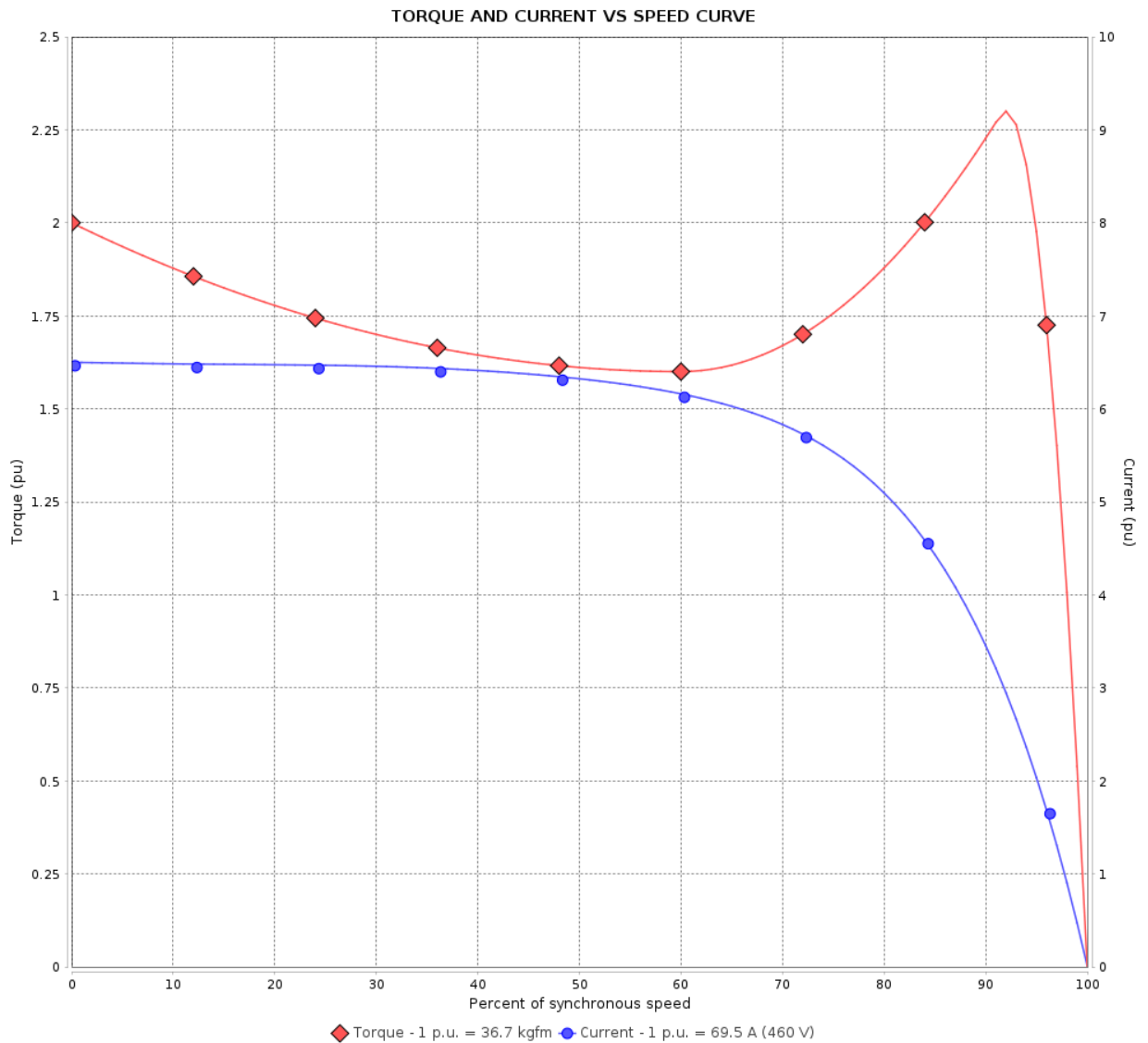
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Performance : 460 V 60 Hz 6P

Rated current : 69.5 A
 LRC : 6.5
 Rated torque : 36.7 kgfm
 Locked rotor torque : 200 %
 Breakdown torque : 229 %
 Rated speed : 1185 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.25
 Temperature rise : 80 K
 Design : B

Locked rotor time : 36s (cold) 20s (hot)

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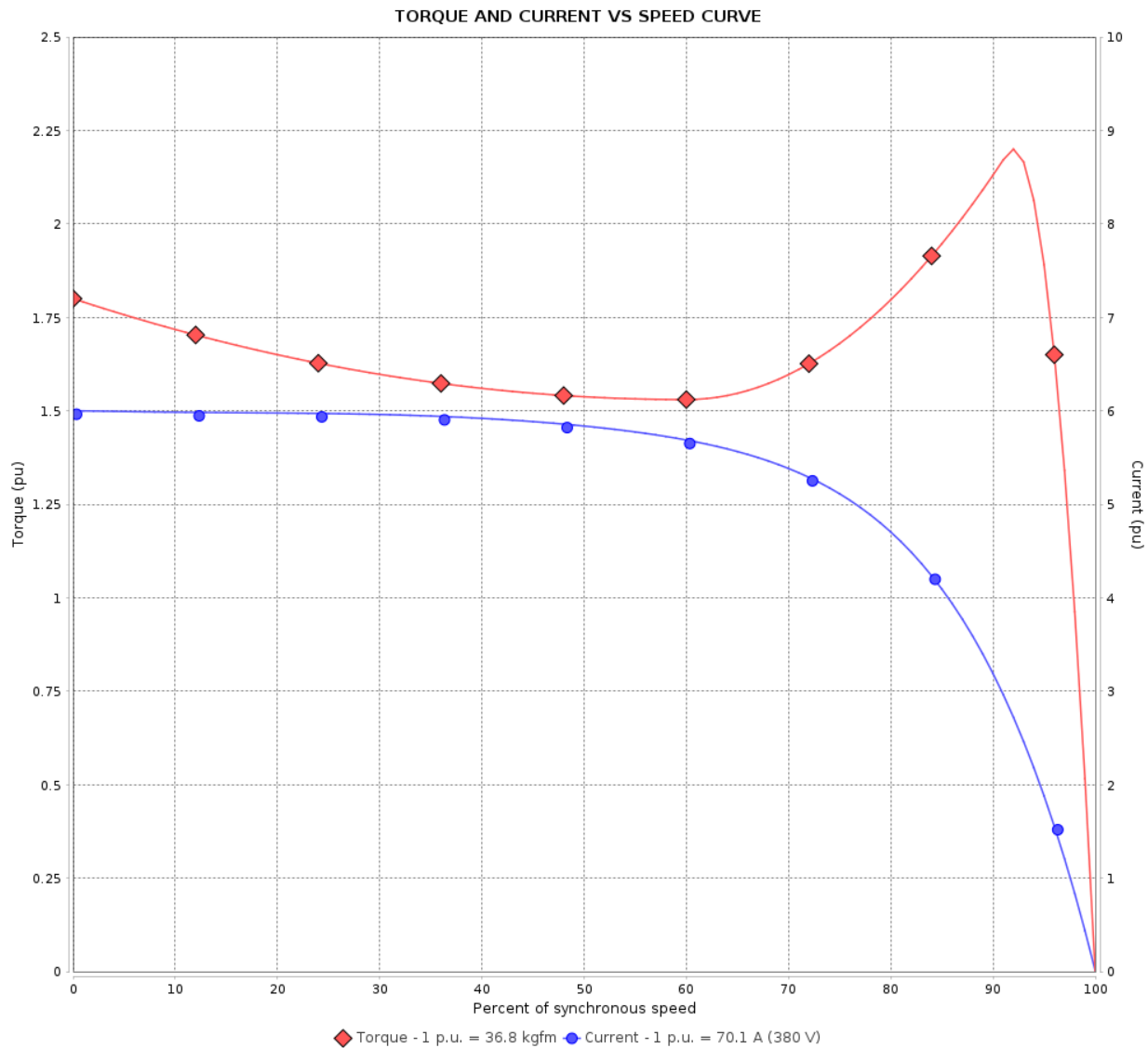


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Performance : 380 V 50 Hz 6P IE3

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|---------------------|-------------|-----------------------|-------------------------|
| Rated current | : 70.1 A | Moment of inertia (J) | : 1.55 kgm ² |
| LRC | : 6.0 | Duty cycle | : Cont.(S1) |
| Rated torque | : 36.8 kgfm | Insulation class | : F |
| Locked rotor torque | : 180 % | Service factor | : 1.00 |
| Breakdown torque | : 220 % | Temperature rise | : 80 K |
| Rated speed | : 985 rpm | Design | : B |

Locked rotor time : 28s (cold) 16s (hot)

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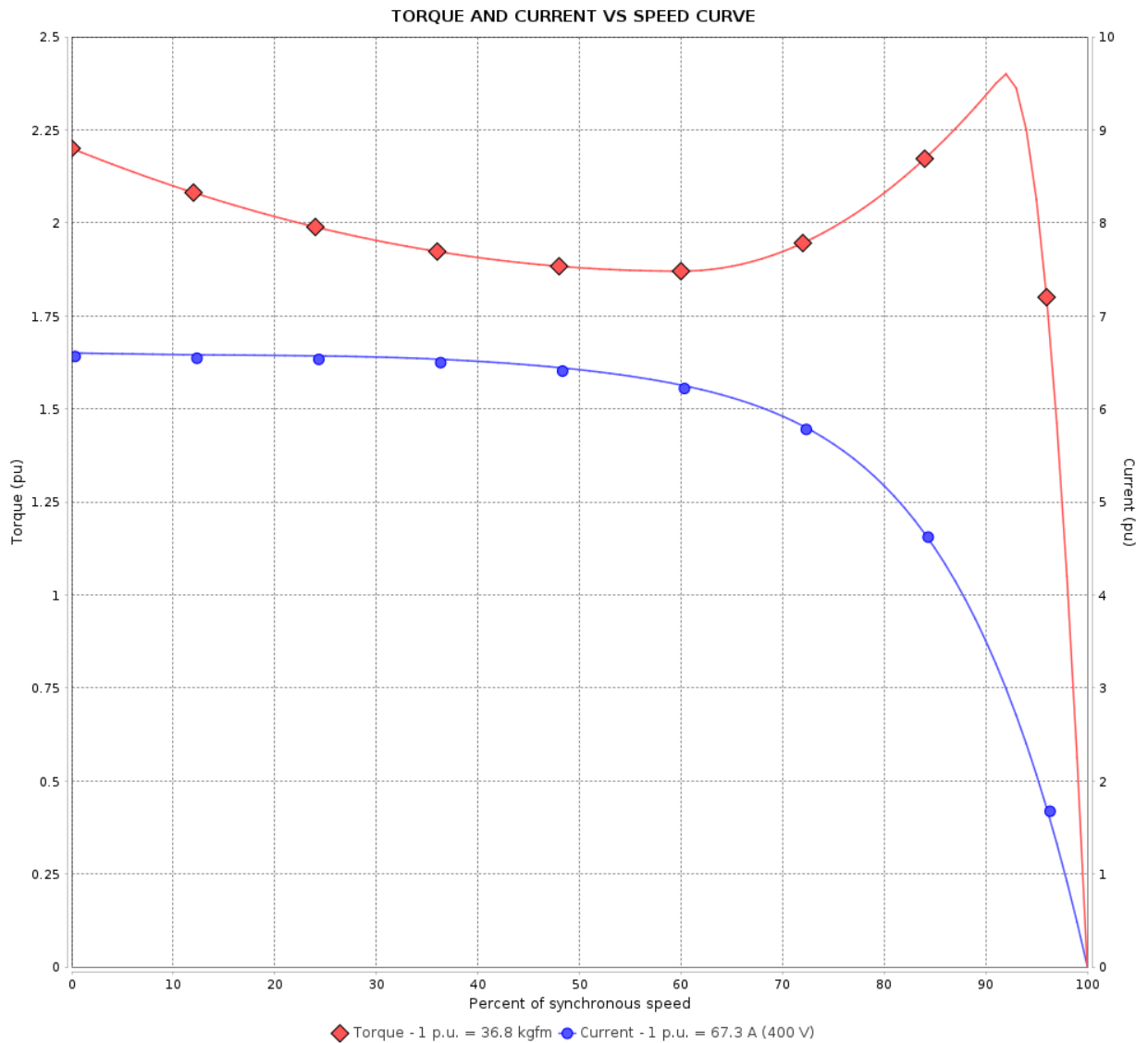
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Rated current : 67.3 A
 LRC : 6.6
 Rated torque : 36.8 kgfm
 Locked rotor torque : 220 %
 Breakdown torque : 240 %
 Rated speed : 985 rpm

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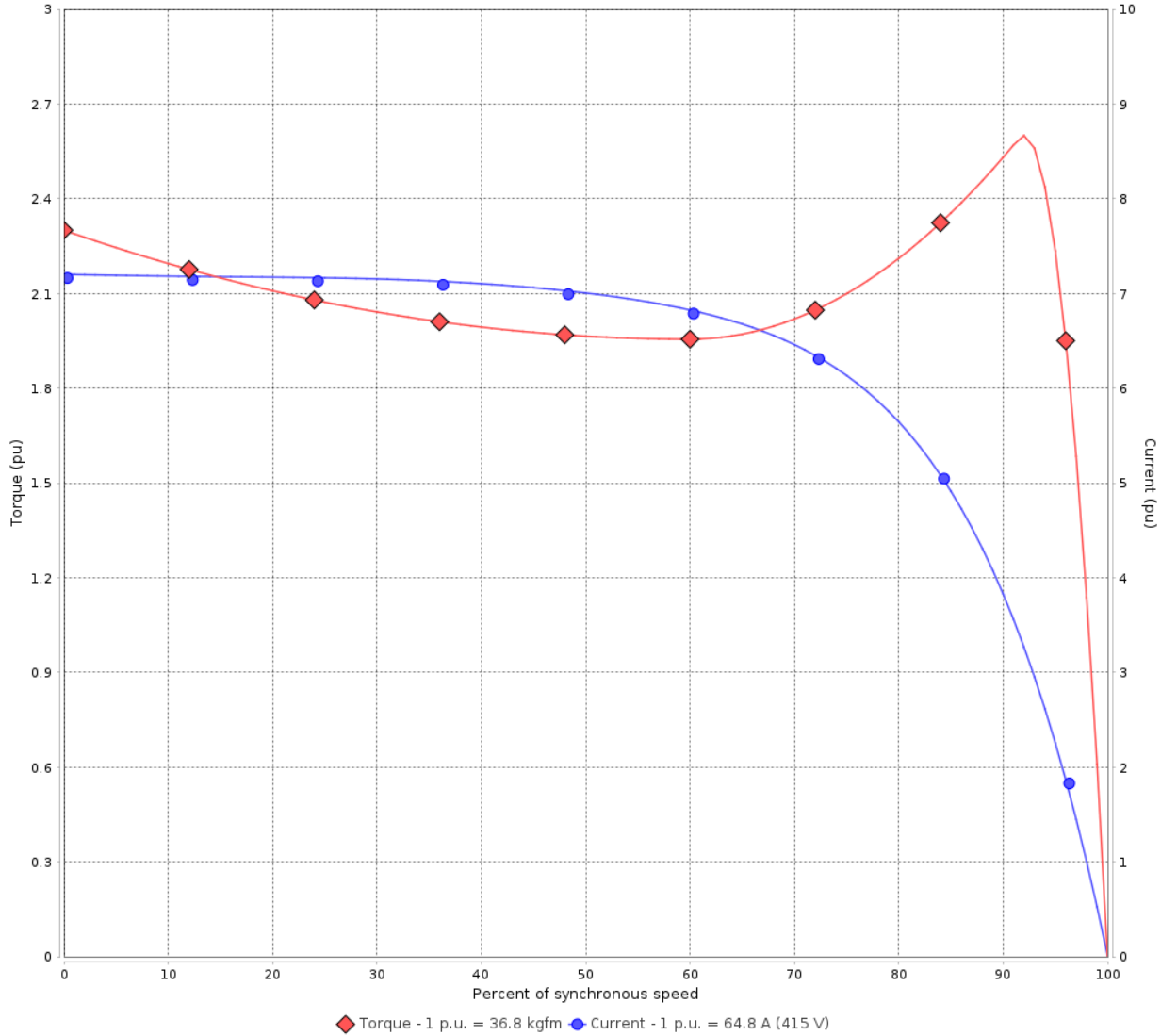
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Performance : 415 V 50 Hz 6P IE3

| | | | |
|---------------------|-------------|-----------------------|-------------------------|
| Rated current | : 64.8 A | Moment of inertia (J) | : 1.55 kgm ² |
| LRC | : 7.2 | Duty cycle | : Cont.(S1) |
| Rated torque | : 36.8 kgfm | Insulation class | : F |
| Locked rotor torque | : 229 % | Service factor | : 1.00 |
| Breakdown torque | : 260 % | Temperature rise | : 80 K |
| Rated speed | : 985 rpm | Design | : B |

Locked rotor time : 28s (cold) 16s (hot)

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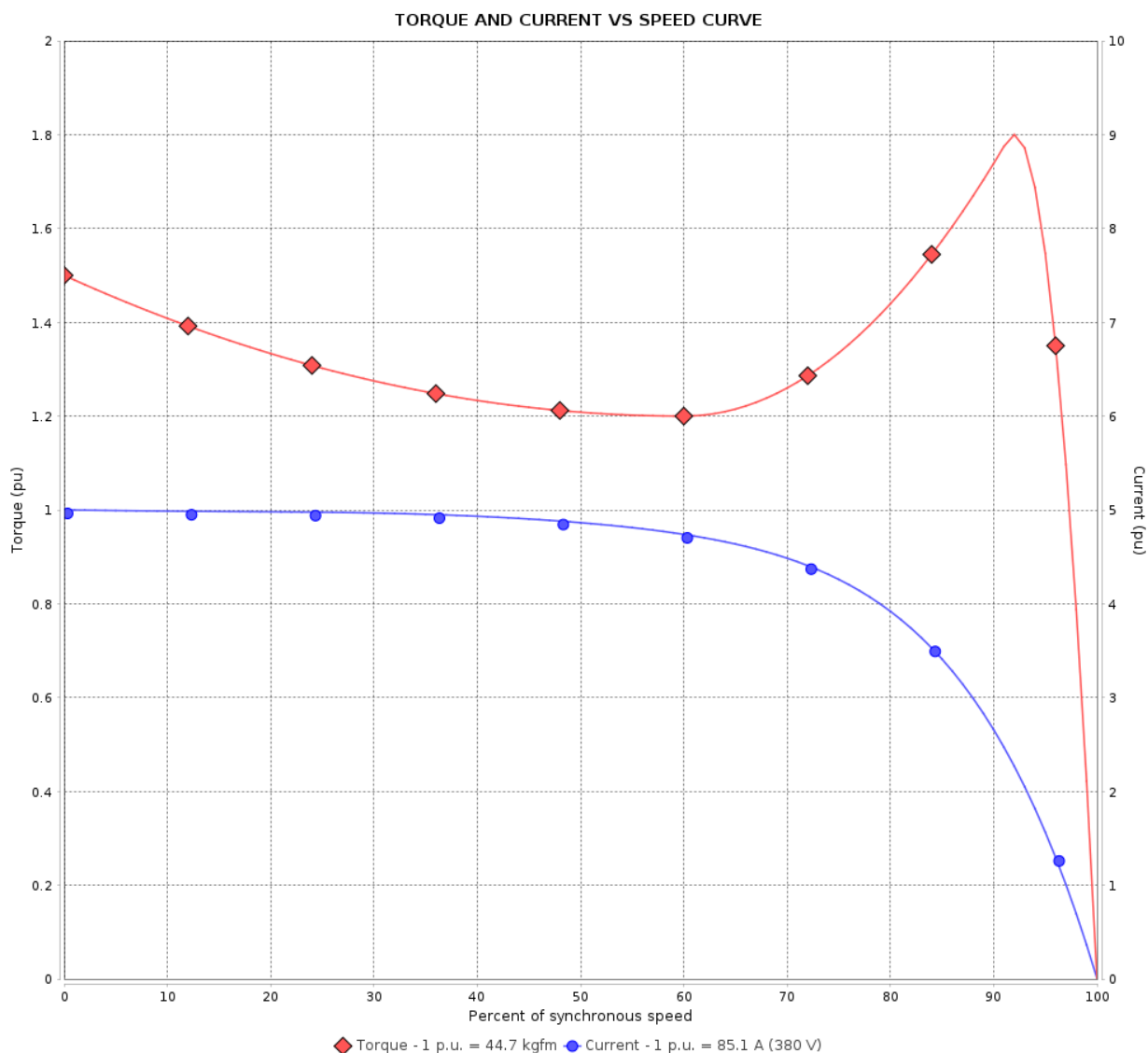
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Performance : 380 V 50 Hz 6P IE1

Rated current : 85.1 A
 LRC : 5.0
 Rated torque : 44.7 kgfm
 Locked rotor torque : 150 %
 Breakdown torque : 180 %
 Rated speed : 975 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.00
 Temperature rise : 105 K
 Design : B

Locked rotor time : 28s (cold) 16s (hot)

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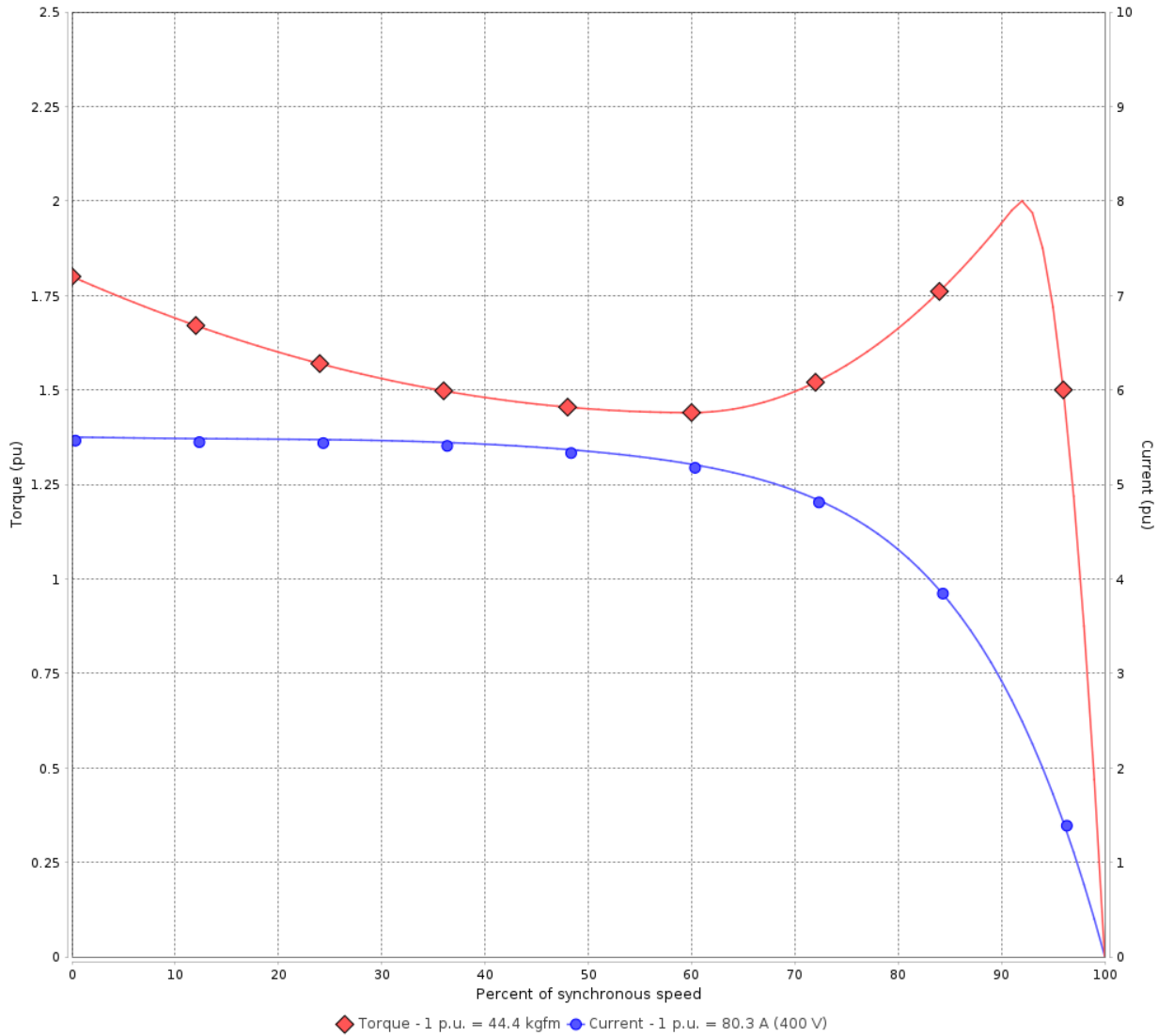
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TORQUE AND CURRENT VS SPEED CURVE



Performance : 400 V 50 Hz 6P IE2

Rated current : 80.3 A
 LRC : 5.5
 Rated torque : 44.4 kgfm
 Locked rotor torque : 180 %
 Breakdown torque : 200 %
 Rated speed : 980 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.00
 Temperature rise : 80 K
 Design : B

Locked rotor time : 28s (cold) 16s (hot)

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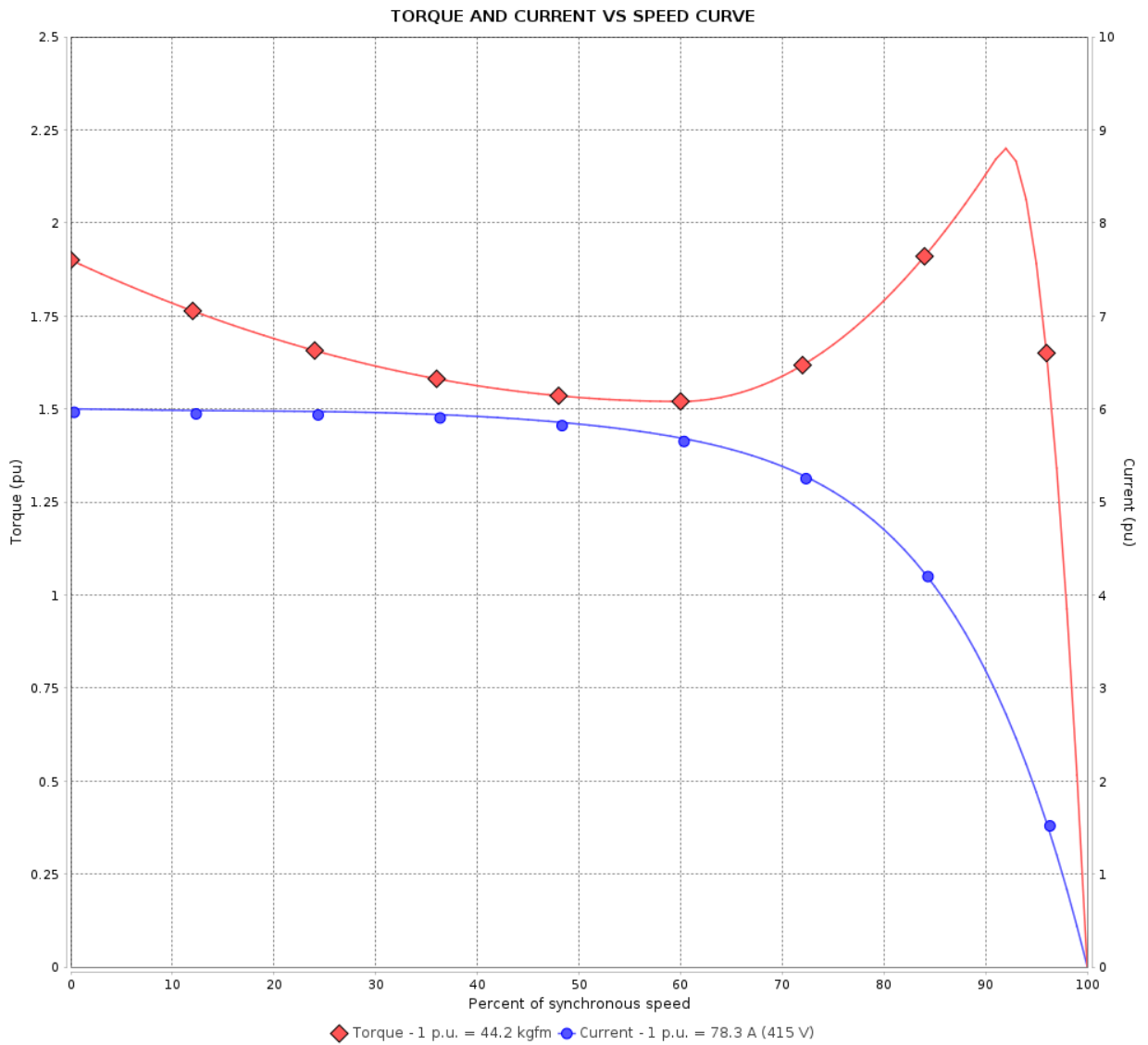
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Performance : 415 V 50 Hz 6P IE2

| | | | |
|---------------------|-------------|-----------------------|-------------------------|
| Rated current | : 78.3 A | Moment of inertia (J) | : 1.55 kgm ² |
| LRC | : 6.0 | Duty cycle | : Cont.(S1) |
| Rated torque | : 44.2 kgfm | Insulation class | : F |
| Locked rotor torque | : 190 % | Service factor | : 1.00 |
| Breakdown torque | : 220 % | Temperature rise | : 80 K |
| Rated speed | : 985 rpm | Design | : B |

Locked rotor time : 28s (cold) 16s (hot)

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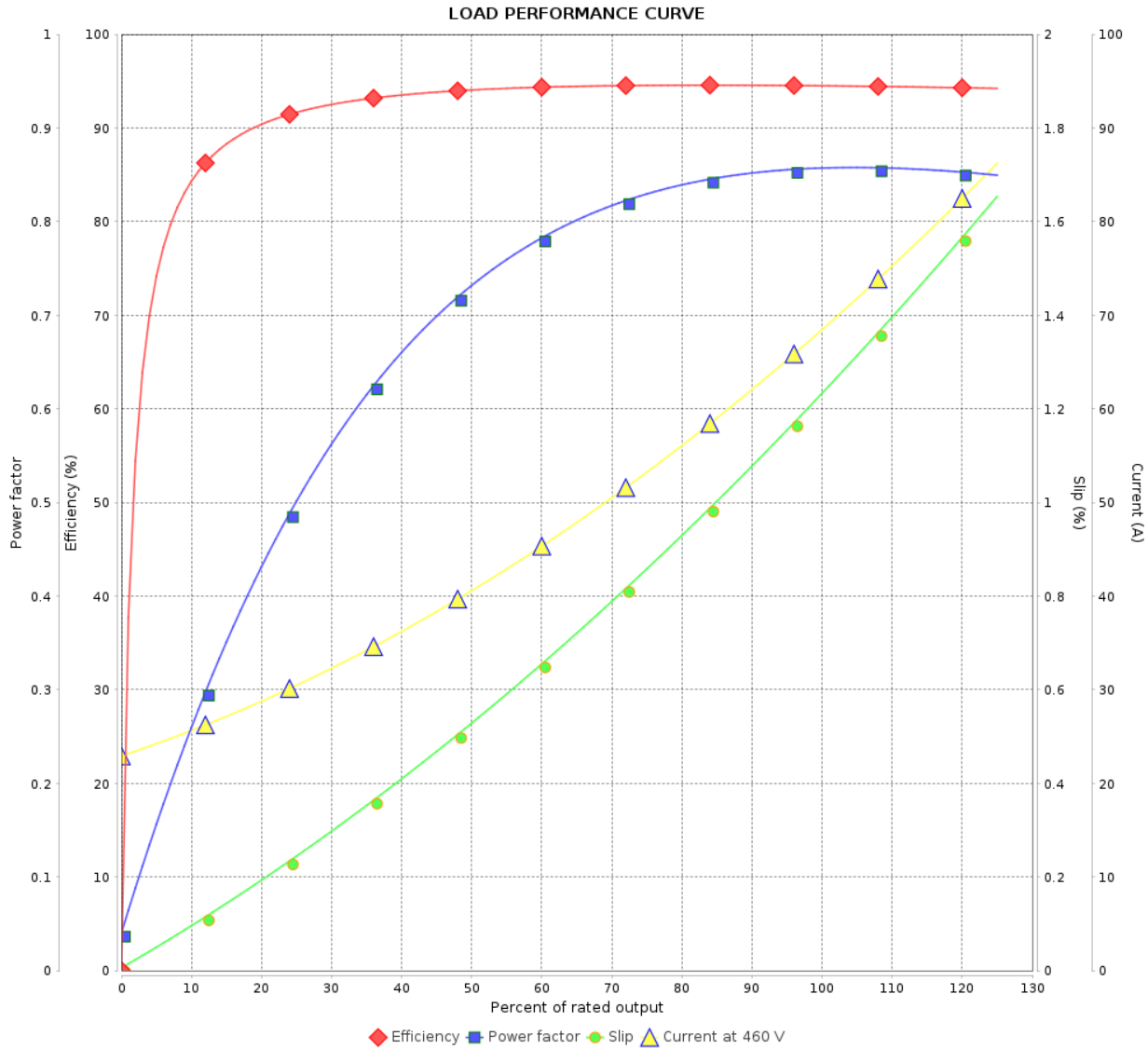


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 Breakdown torque : 229 %
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 Service factor : 1.25
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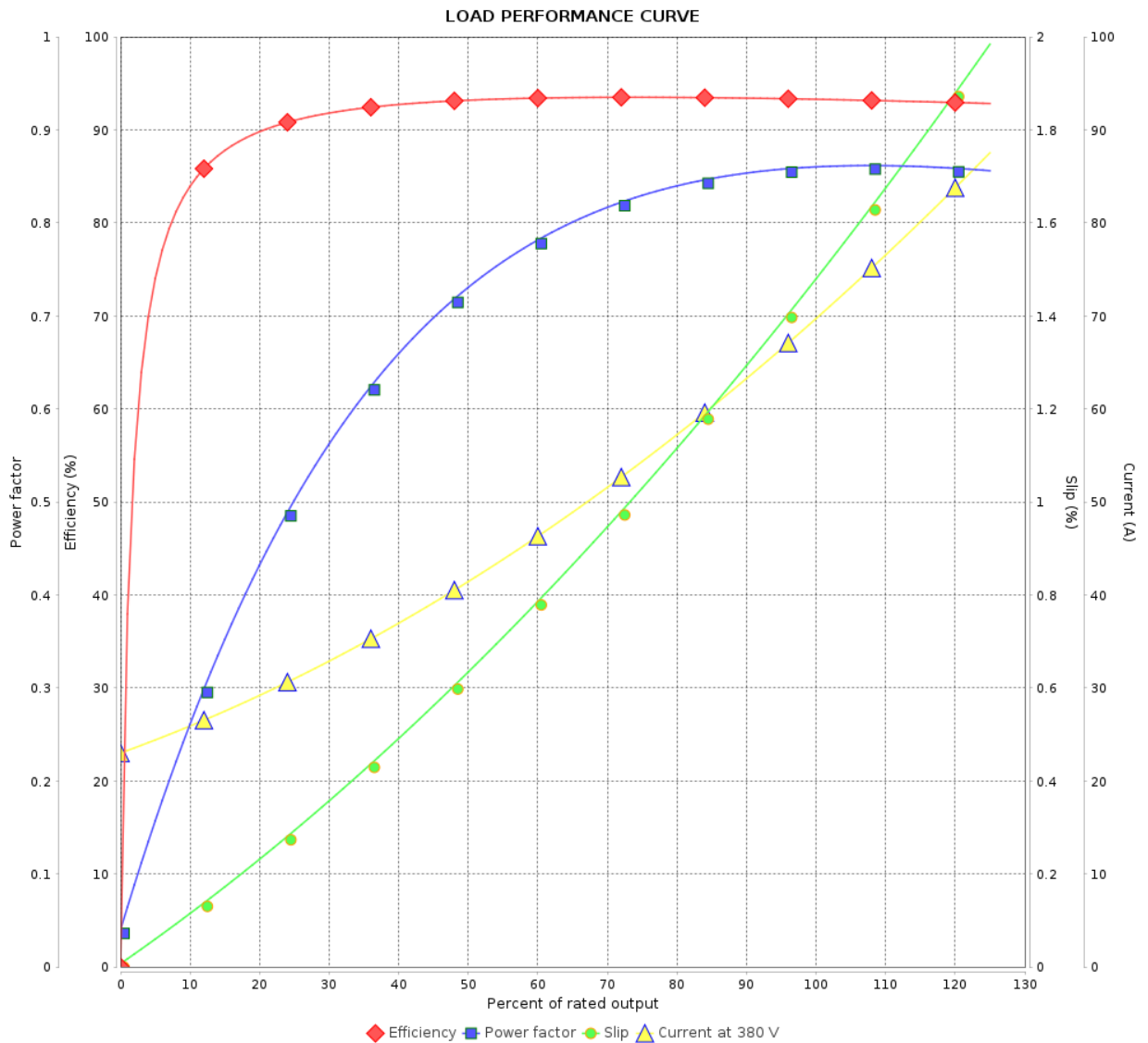


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Performance : 380 V 50 Hz 6P IE3

Rated current : 70.1 A
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 Breakdown torque : 220 %
 Rated speed : 985 rpm

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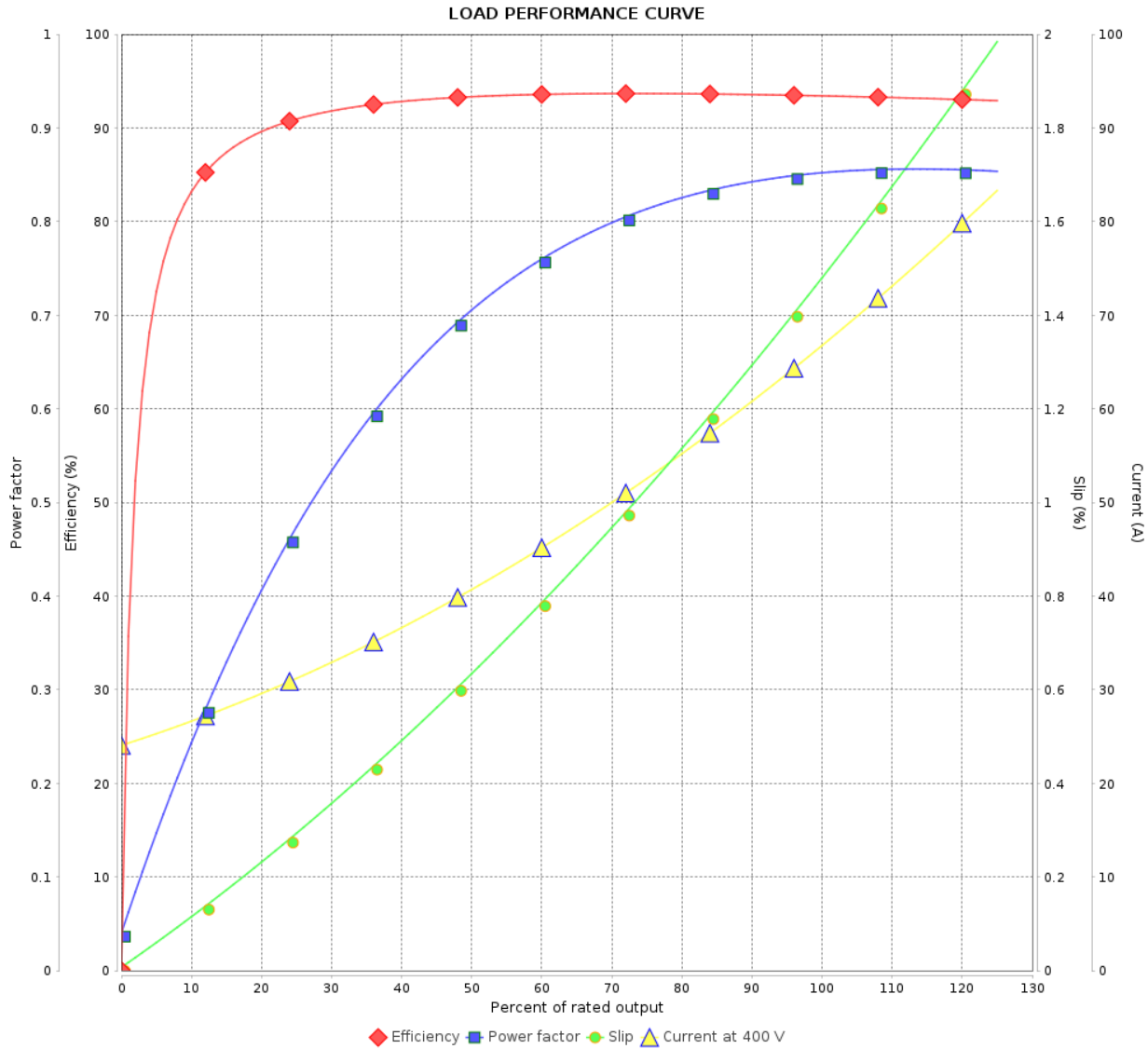


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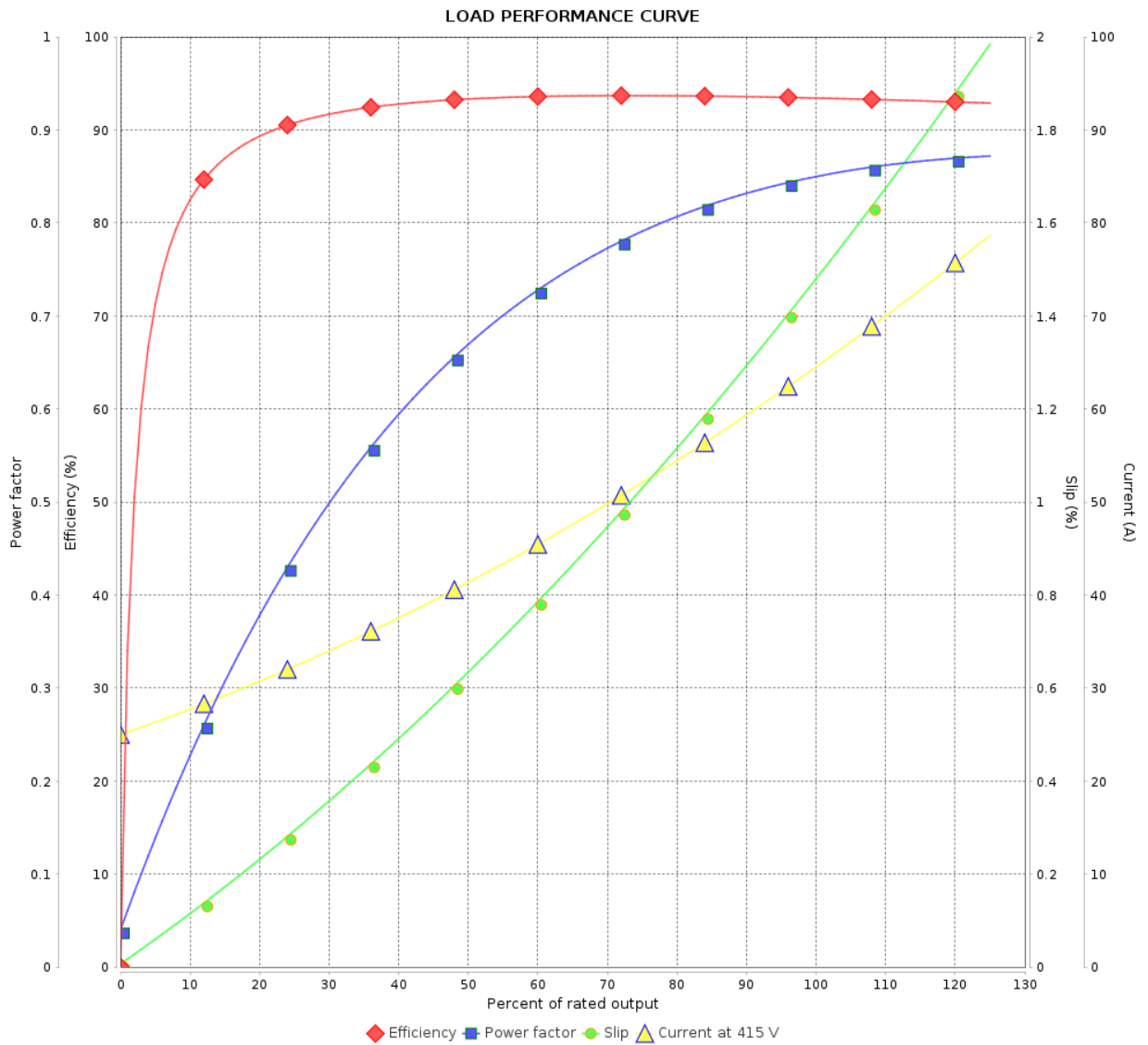


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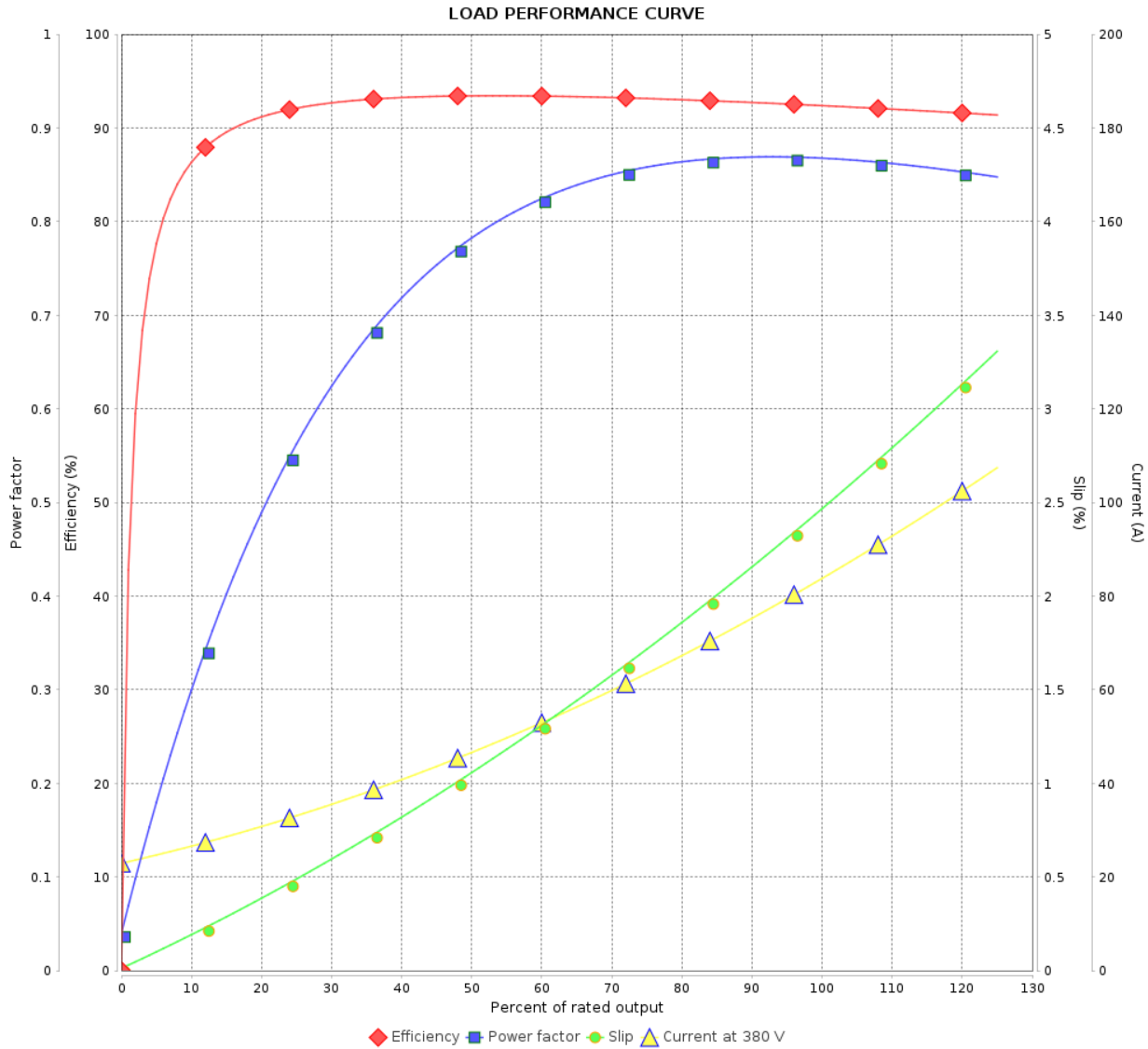


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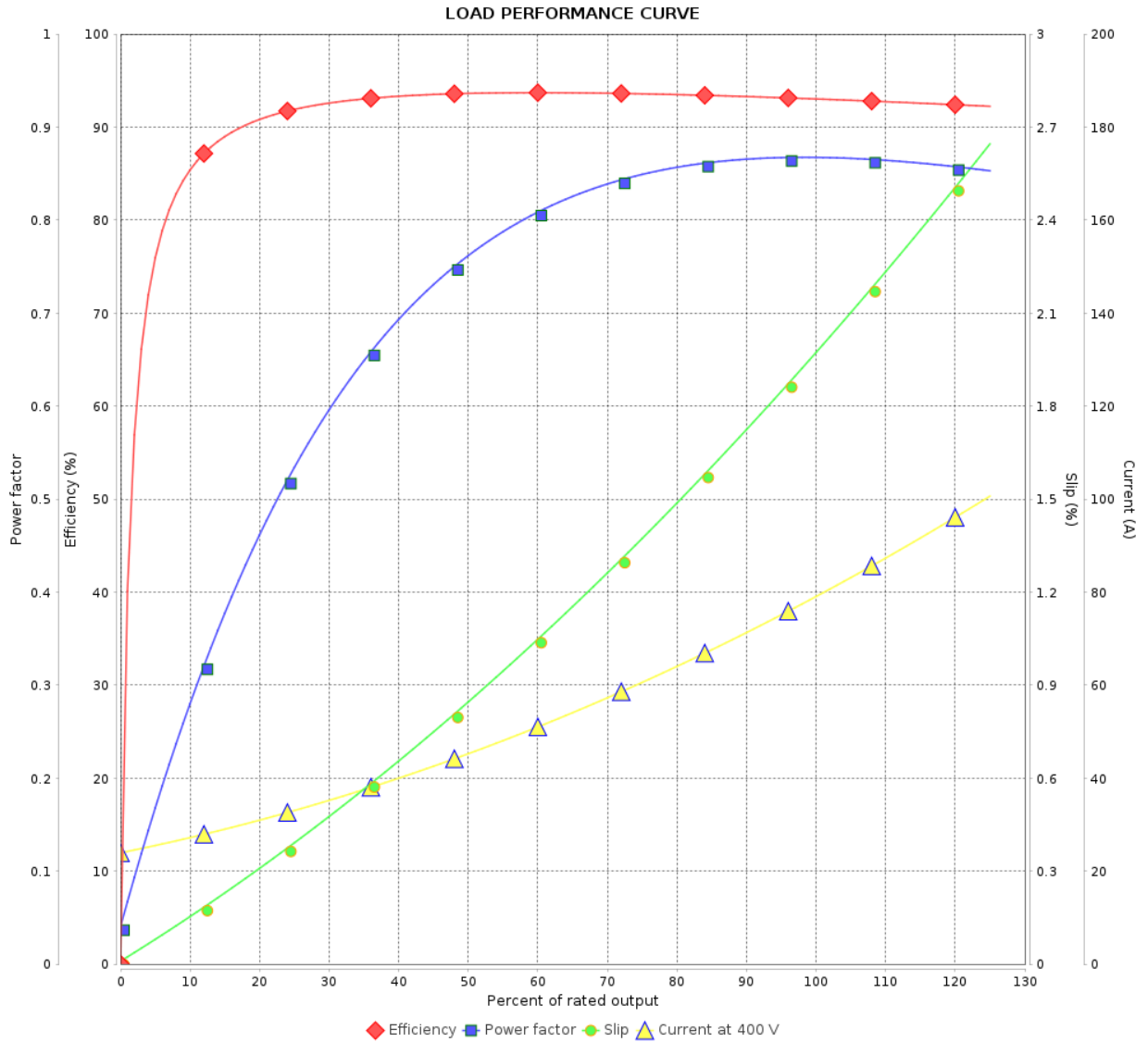


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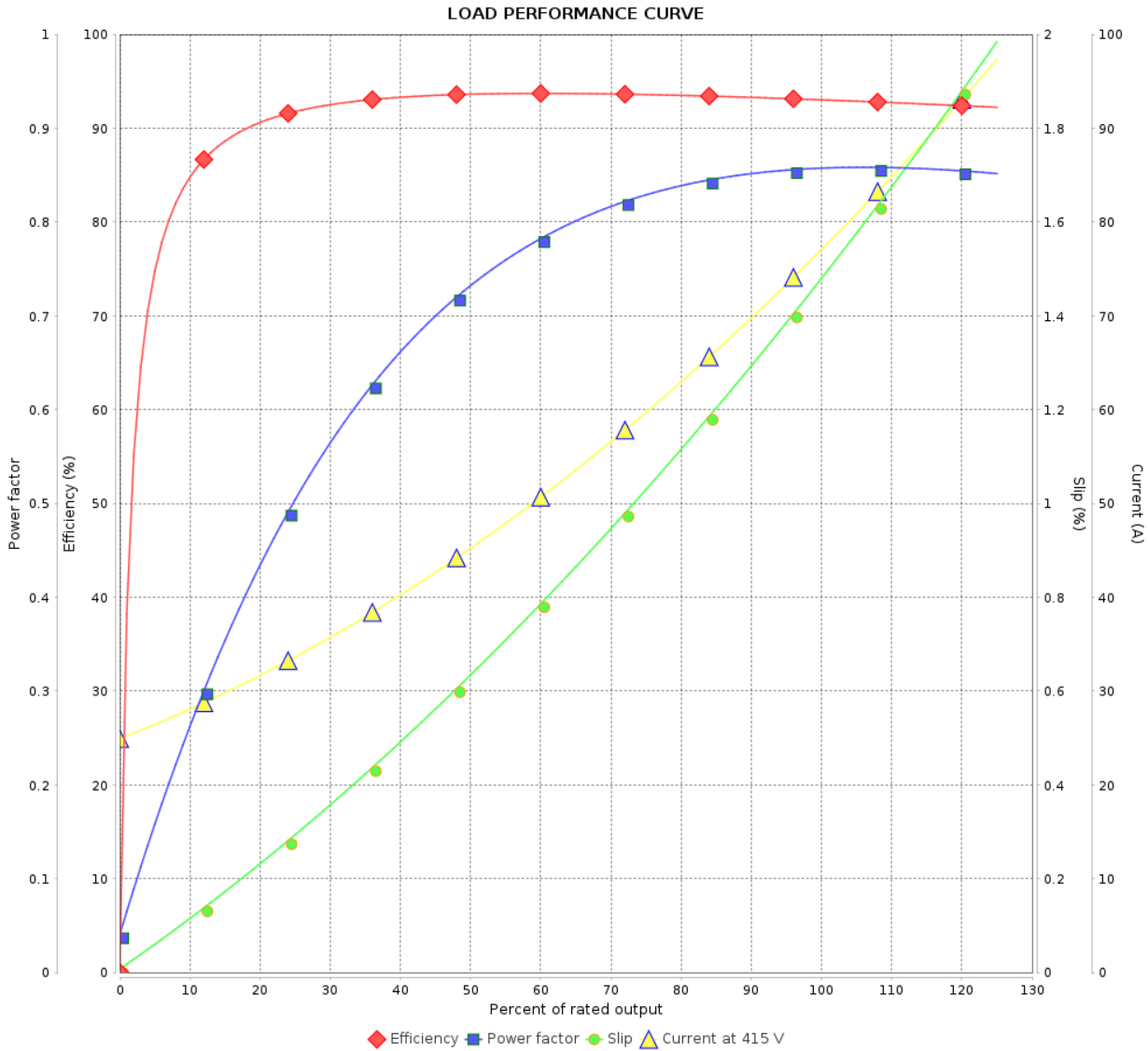


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THERMAL LIMIT CURVE



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Heating constant

Cooling constant

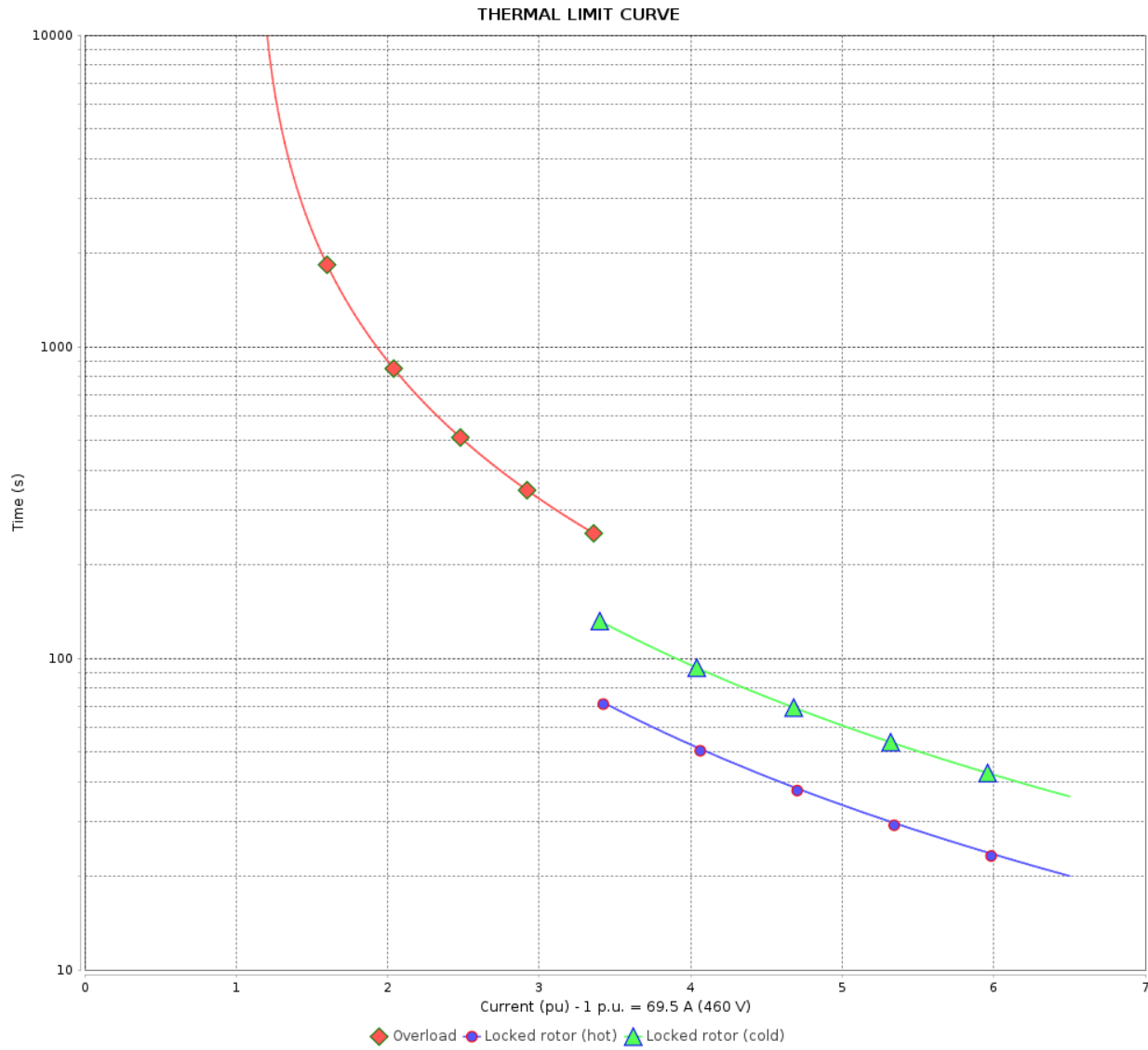
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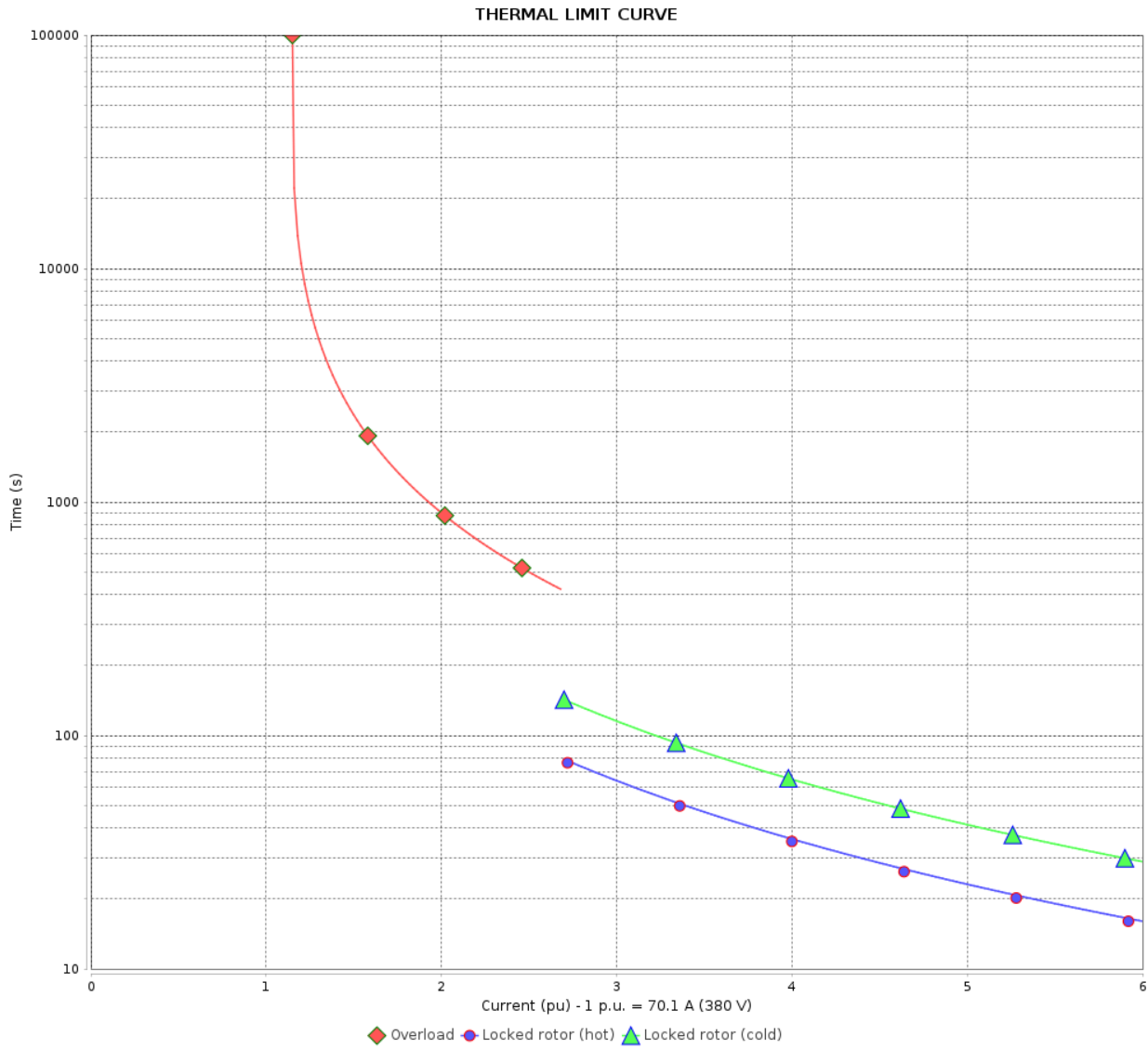
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Breakdown torque : 240 %
Rated speed : 985 rpm

Moment of inertia (J) : 1.55 kgm²
Duty cycle : Cont.(S1)
Insulation class : F
Service factor : 1.00
Temperature rise : 80 K
Design : B

Heating constant

Cooling constant

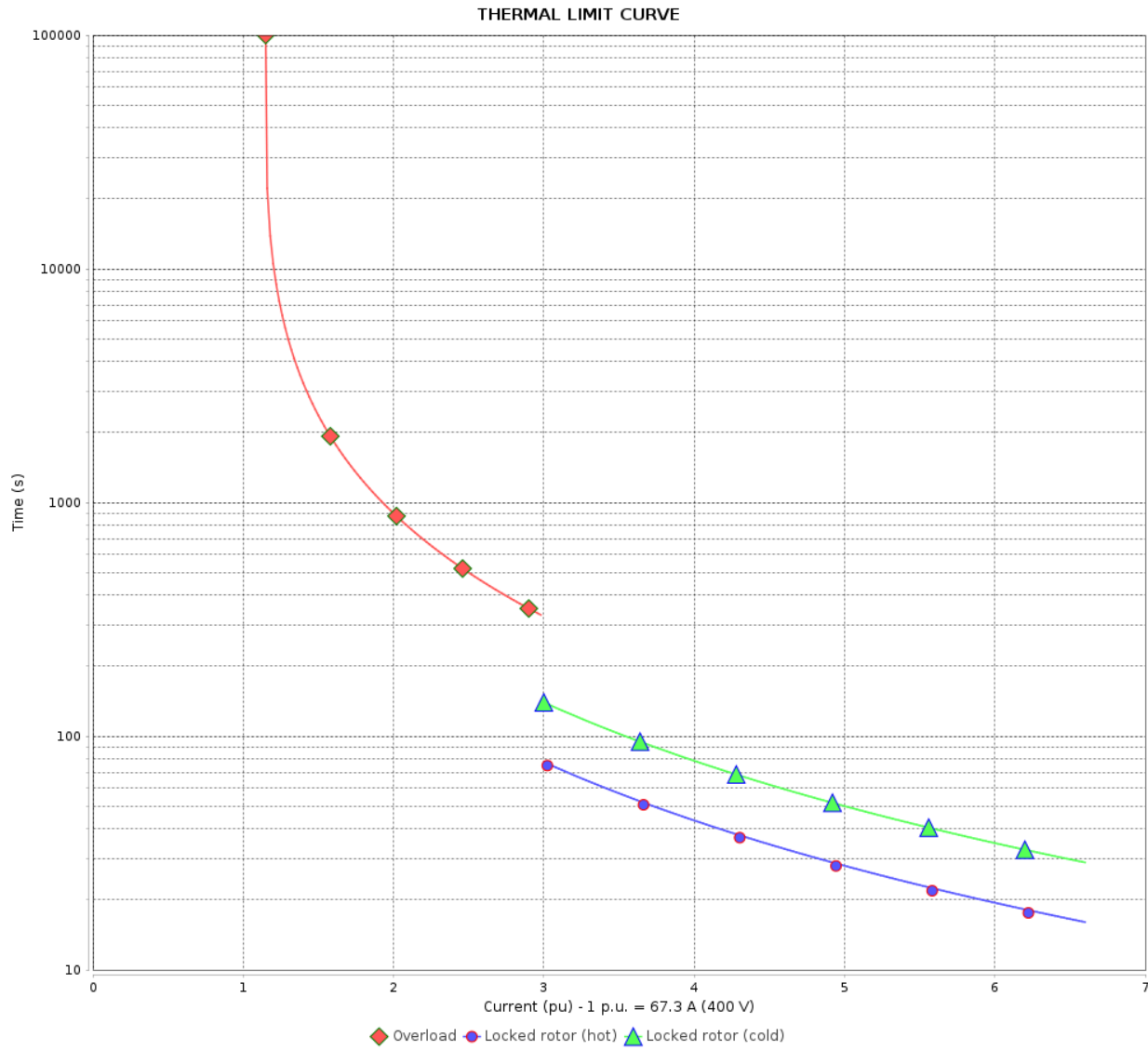
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THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer : _____



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THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase Product code : 11431398
 Catalog # : 06012ST3QIE404T-W22

Performance : 415 V 50 Hz 6P IE3

| | |
|-----------------------------|---|
| Rated current : 64.8 A | Moment of inertia (J) : 1.55 kgm ² |
| LRC : 7.2 | Duty cycle : Cont.(S1) |
| Rated torque : 36.8 kgfm | Insulation class : F |
| Locked rotor torque : 229 % | Service factor : 1.00 |
| Breakdown torque : 260 % | Temperature rise : 80 K |
| Rated speed : 985 rpm | Design : B |

Heating constant

Cooling constant

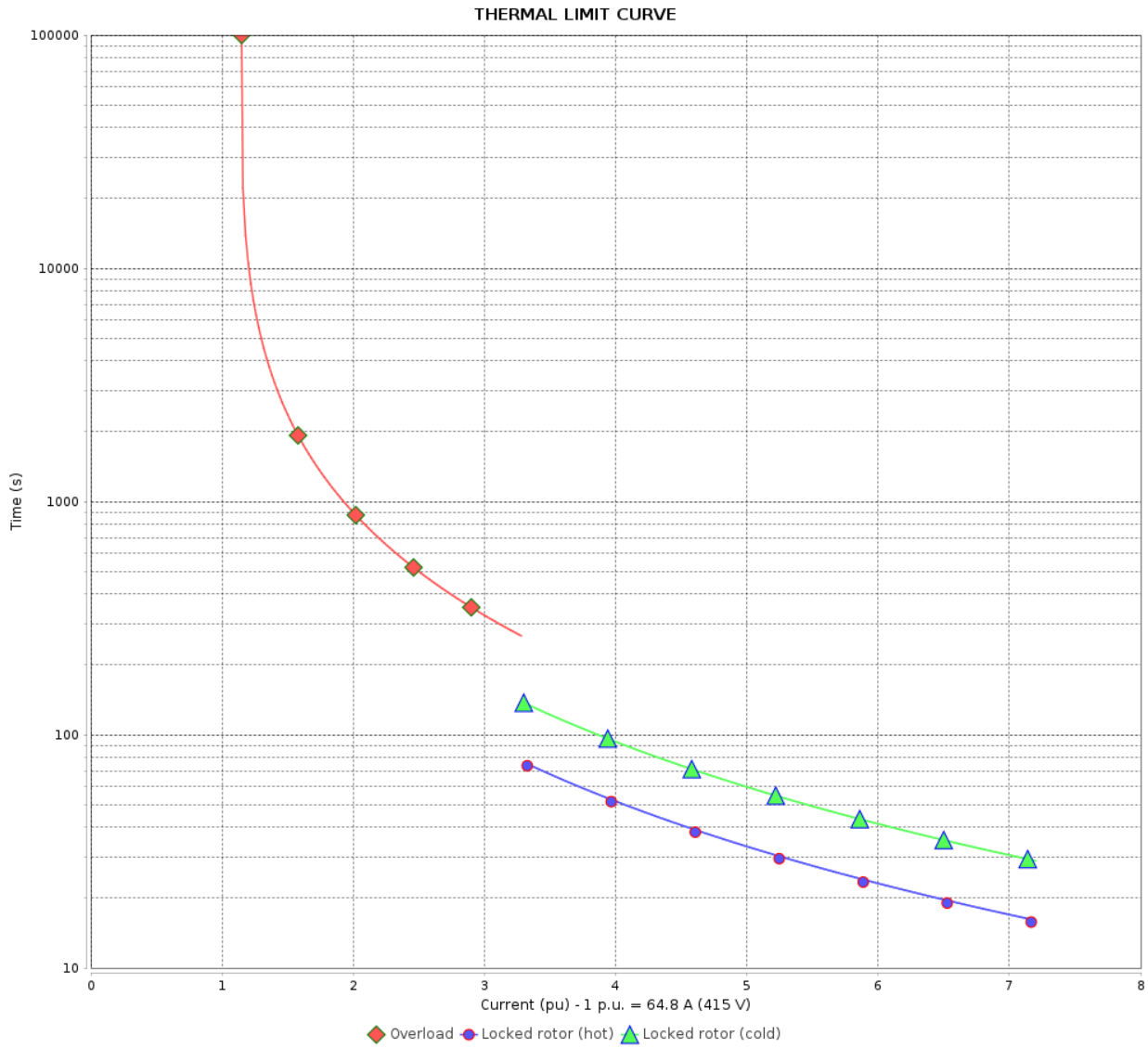
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THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer : _____



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THERMAL LIMIT CURVE



Three Phase Induction Motor - Squirrel Cage

Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase Product code : 11431398
 Catalog # : 06012ST3QIE404T-W22

Performance : 380 V 50 Hz 6P IE1

| | |
|-----------------------------|---|
| Rated current : 85.1 A | Moment of inertia (J) : 1.55 kgm ² |
| LRC : 5.0 | Duty cycle : Cont.(S1) |
| Rated torque : 44.7 kgfm | Insulation class : F |
| Locked rotor torque : 150 % | Service factor : 1.00 |
| Breakdown torque : 180 % | Temperature rise : 105 K |
| Rated speed : 975 rpm | Design : B |

Heating constant

Cooling constant

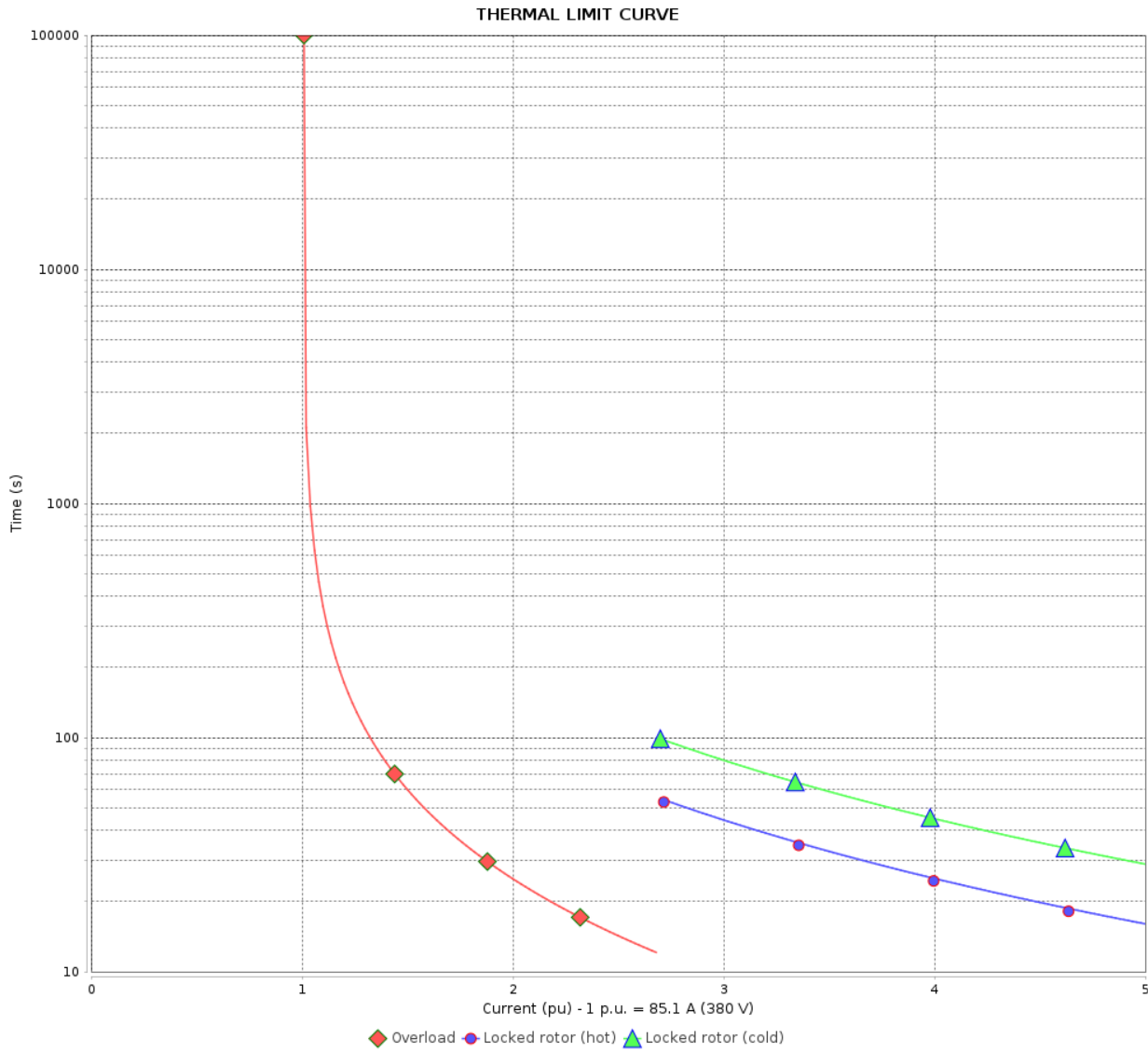
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THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer : _____



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THERMAL LIMIT CURVE



Three Phase Induction Motor - Squirrel Cage

Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase Product code : 11431398
 Catalog # : 06012ST3QIE404T-W22

Performance : 400 V 50 Hz 6P IE2

| | |
|-----------------------------|---|
| Rated current : 80.3 A | Moment of inertia (J) : 1.55 kgm ² |
| LRC : 5.5 | Duty cycle : Cont.(S1) |
| Rated torque : 44.4 kgfm | Insulation class : F |
| Locked rotor torque : 180 % | Service factor : 1.00 |
| Breakdown torque : 200 % | Temperature rise : 80 K |
| Rated speed : 980 rpm | Design : B |

Heating constant

Cooling constant

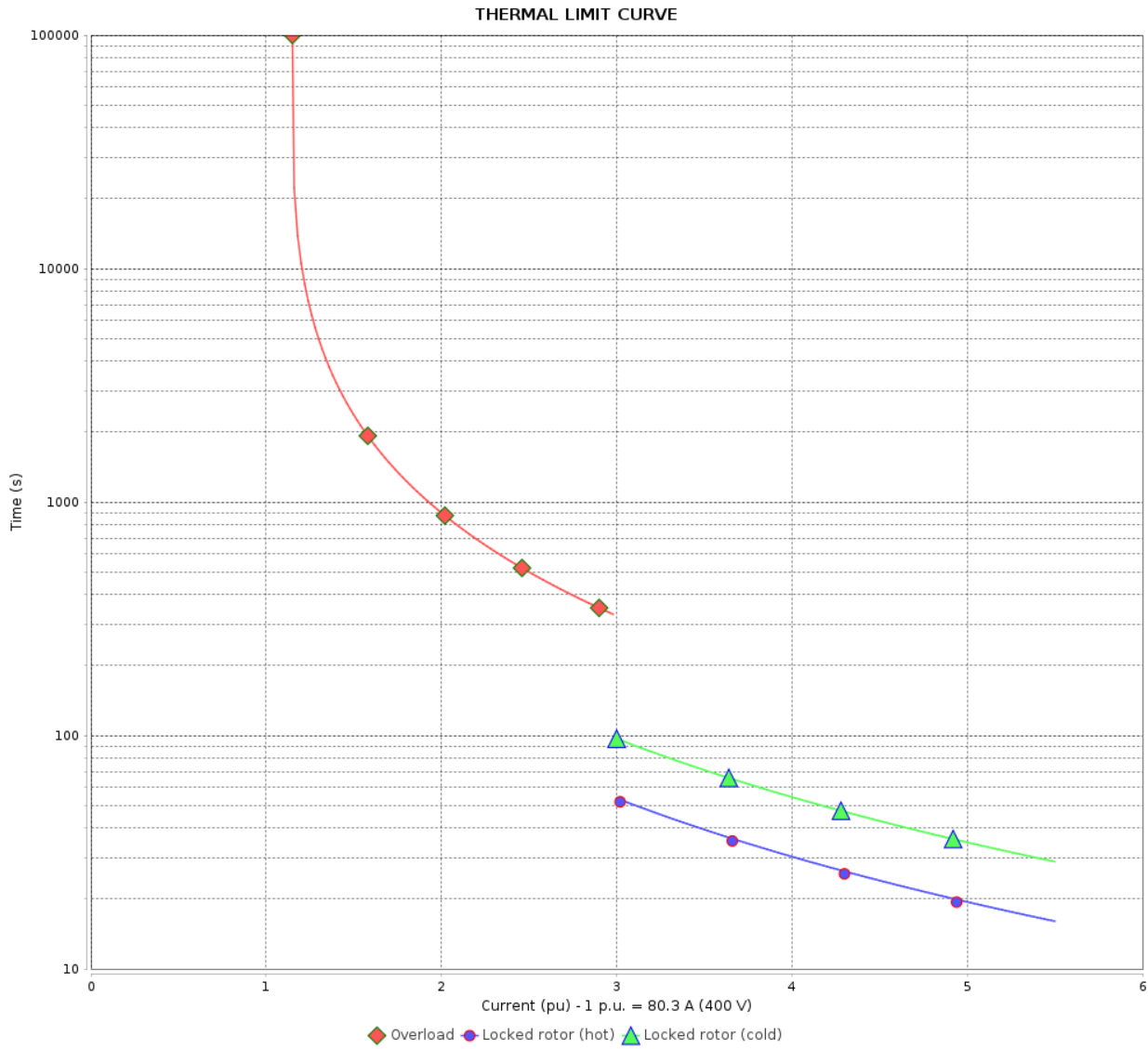
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THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer : _____



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THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase Product code : 11431398
 Catalog # : 06012ST3QIE404T-W22

Performance : 415 V 50 Hz 6P IE2

| | |
|-----------------------------|---|
| Rated current : 78.3 A | Moment of inertia (J) : 1.55 kgm ² |
| LRC : 6.0 | Duty cycle : Cont.(S1) |
| Rated torque : 44.2 kgfm | Insulation class : F |
| Locked rotor torque : 190 % | Service factor : 1.00 |
| Breakdown torque : 220 % | Temperature rise : 80 K |
| Rated speed : 985 rpm | Design : B |

Heating constant

Cooling constant

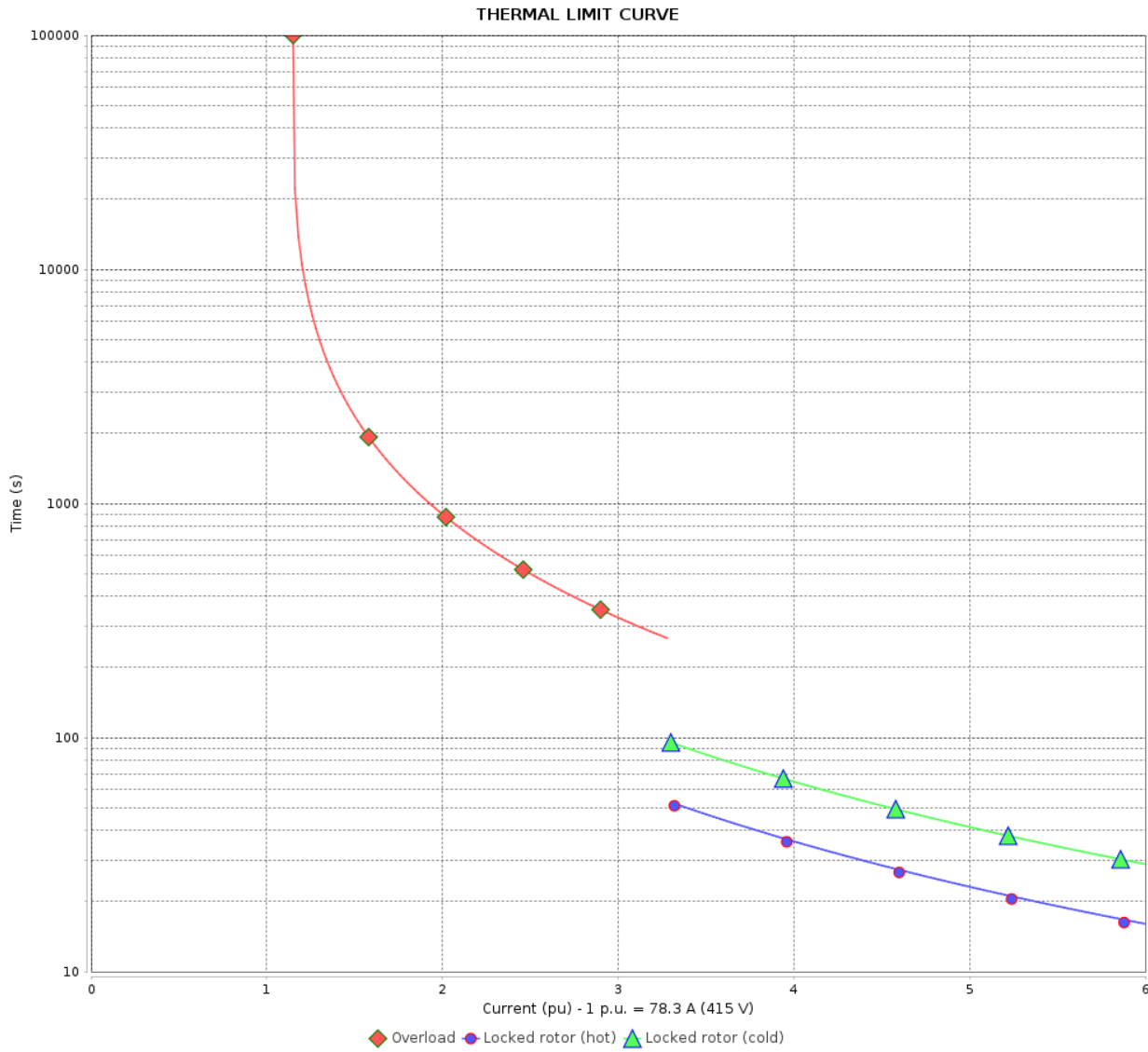
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THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer : _____



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VFD OPERATION CURVE

Three Phase Induction Motor - Squirrel Cage

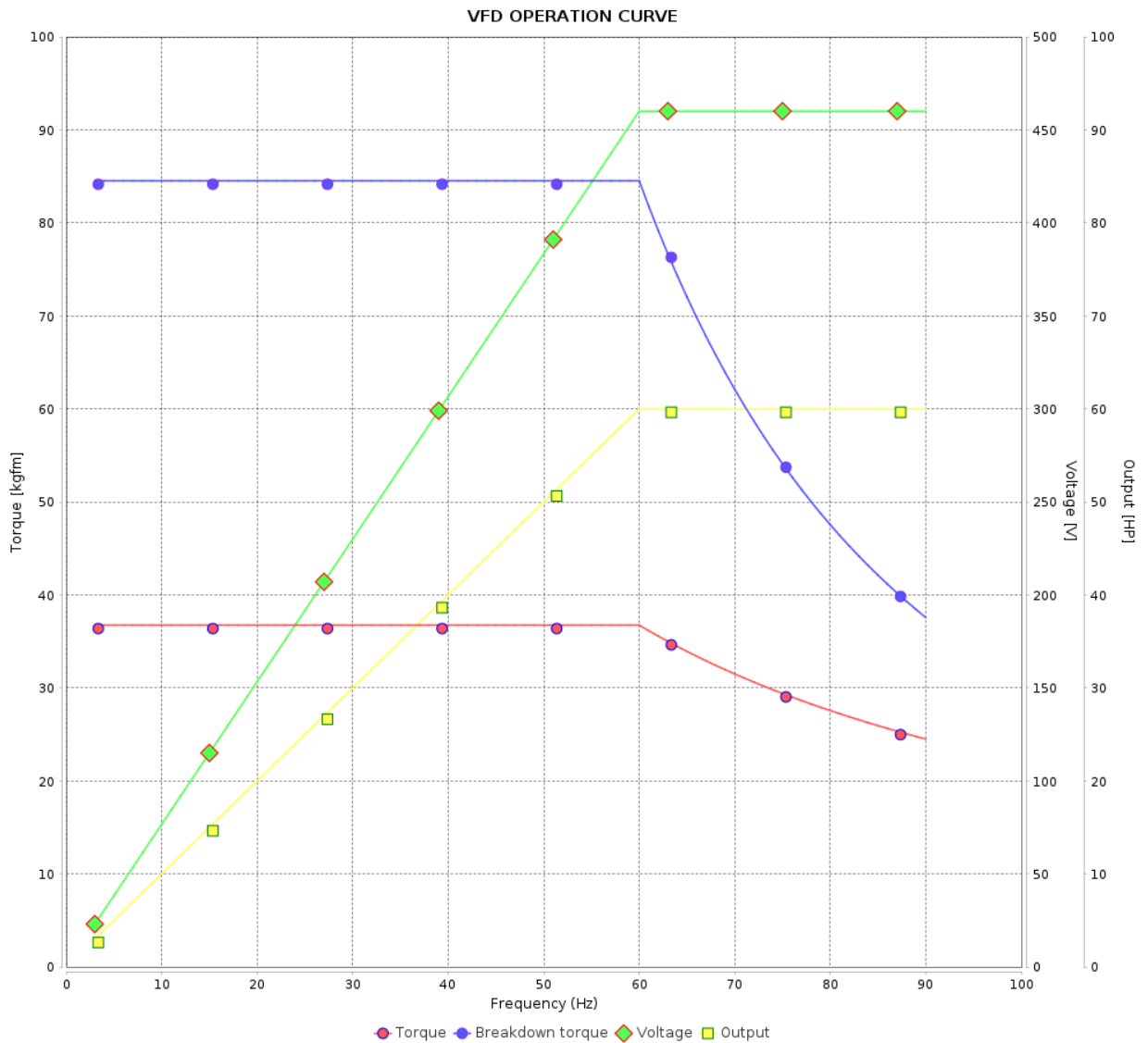


Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase

Product code : 11431398

Catalog # : 06012ST3QIE404T-W22



Performance : 460 V 60 Hz 6P

Rated current : 69.5 A
 LRC : 6.5
 Rated torque : 36.7 kgfm
 Locked rotor torque : 200 %
 Breakdown torque : 229 %
 Rated speed : 1185 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.25
 Temperature rise : 80 K
 Design : B

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VFD OPERATION CURVE

Three Phase Induction Motor - Squirrel Cage

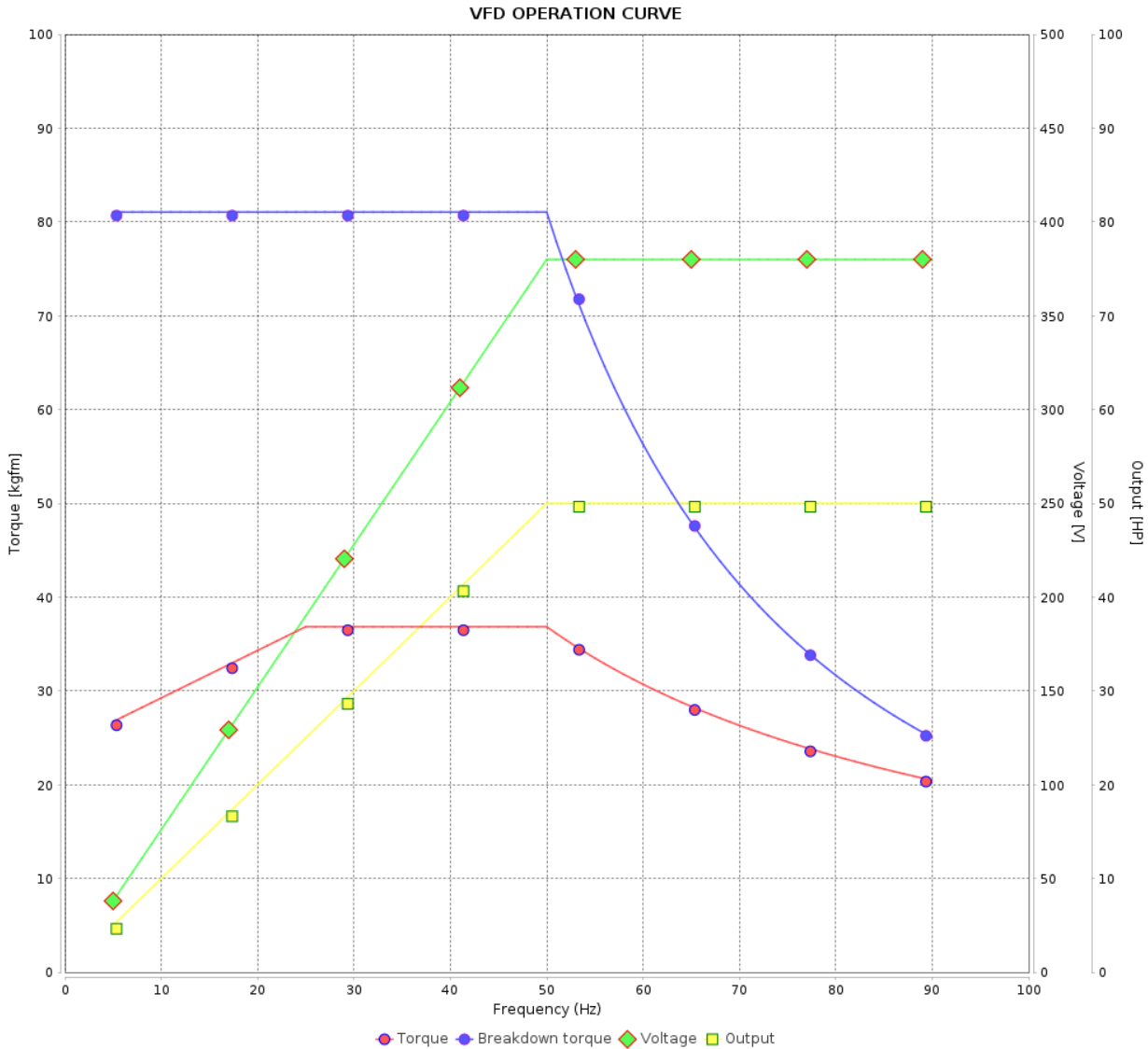


Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase

Product code : 11431398

Catalog # : 06012ST3QIE404T-W22



Performance : 380 V 50 Hz 6P IE3

Rated current : 70.1 A
 LRC : 6.0
 Rated torque : 36.8 kgfm
 Locked rotor torque : 180 %
 Breakdown torque : 220 %
 Rated speed : 985 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.00
 Temperature rise : 80 K
 Design : B

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VFD OPERATION CURVE

Three Phase Induction Motor - Squirrel Cage

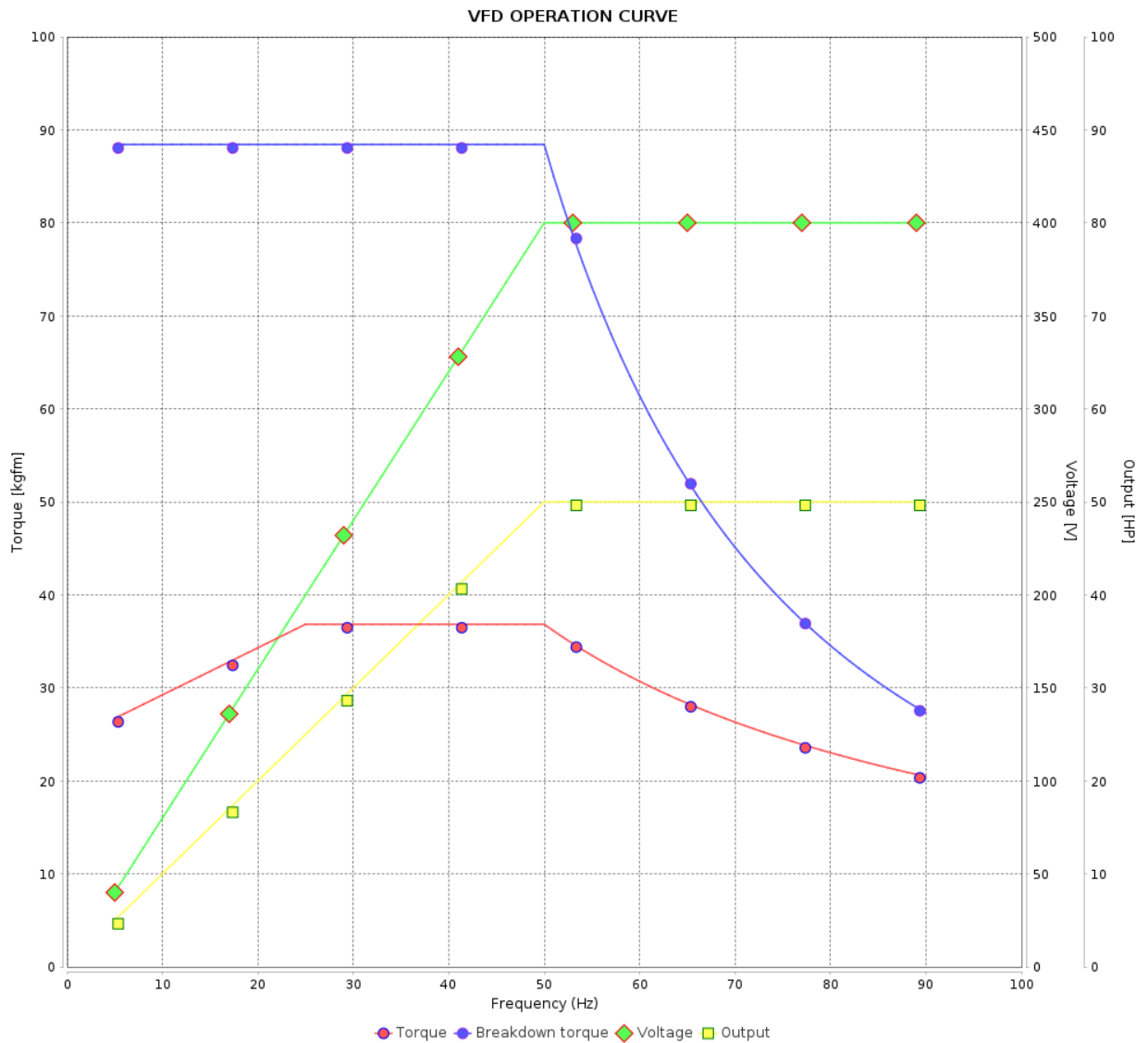


Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase

Product code : 11431398

Catalog # : 06012ST3QIE404T-W22



Performance : 400 V 50 Hz 6P IE3

Rated current : 67.3 A
 LRC : 6.6
 Rated torque : 36.8 kgfm
 Locked rotor torque : 220 %
 Breakdown torque : 240 %
 Rated speed : 985 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.00
 Temperature rise : 80 K
 Design : B

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VFD OPERATION CURVE

Three Phase Induction Motor - Squirrel Cage

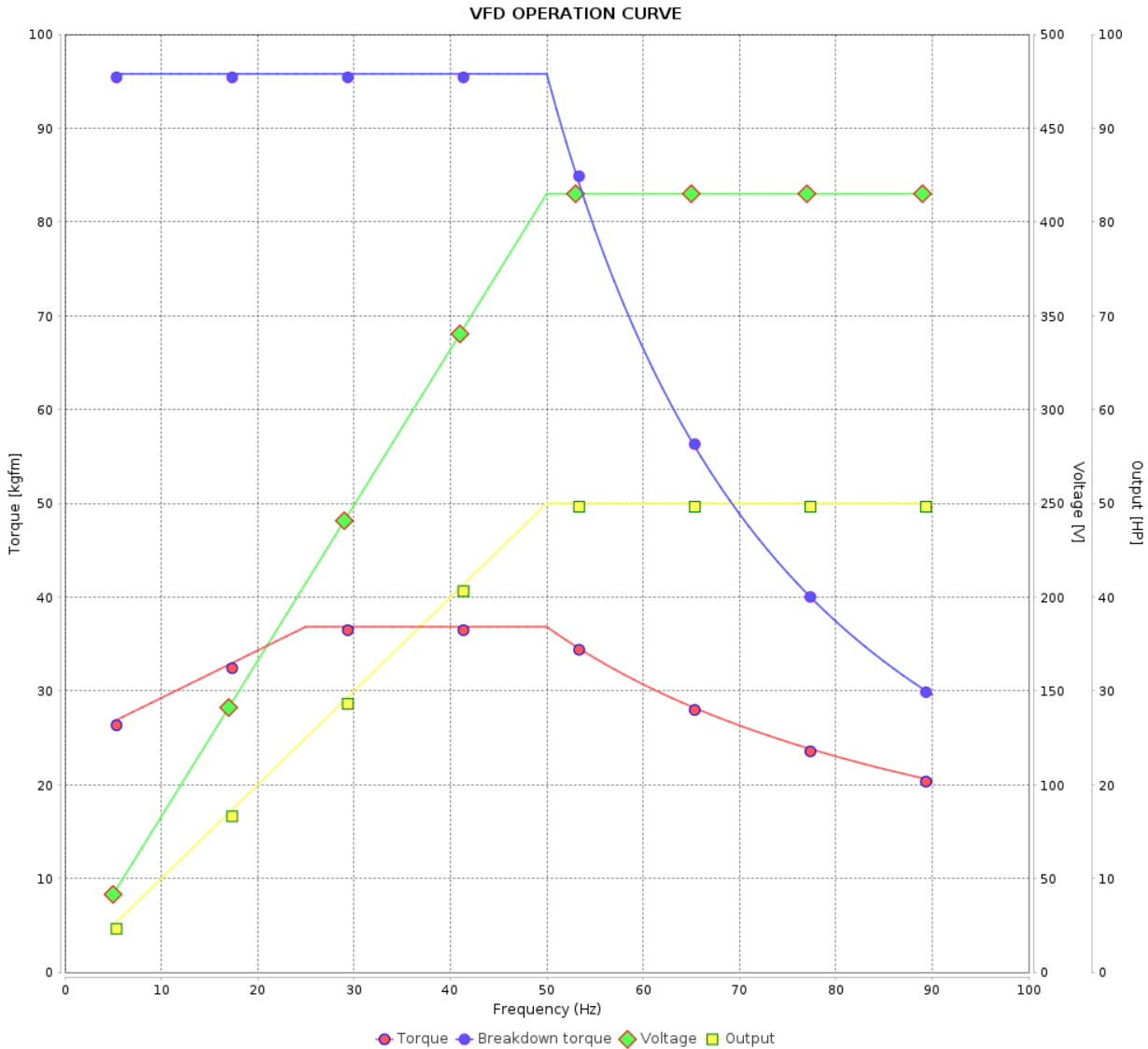


Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase

Product code : 11431398

Catalog # : 06012ST3QIE404T-W22



Performance : 415 V 50 Hz 6P IE3

Rated current : 64.8 A
 LRC : 7.2
 Rated torque : 36.8 kgfm
 Locked rotor torque : 229 %
 Breakdown torque : 260 %
 Rated speed : 985 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.00
 Temperature rise : 80 K
 Design : B

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VFD OPERATION CURVE

Three Phase Induction Motor - Squirrel Cage

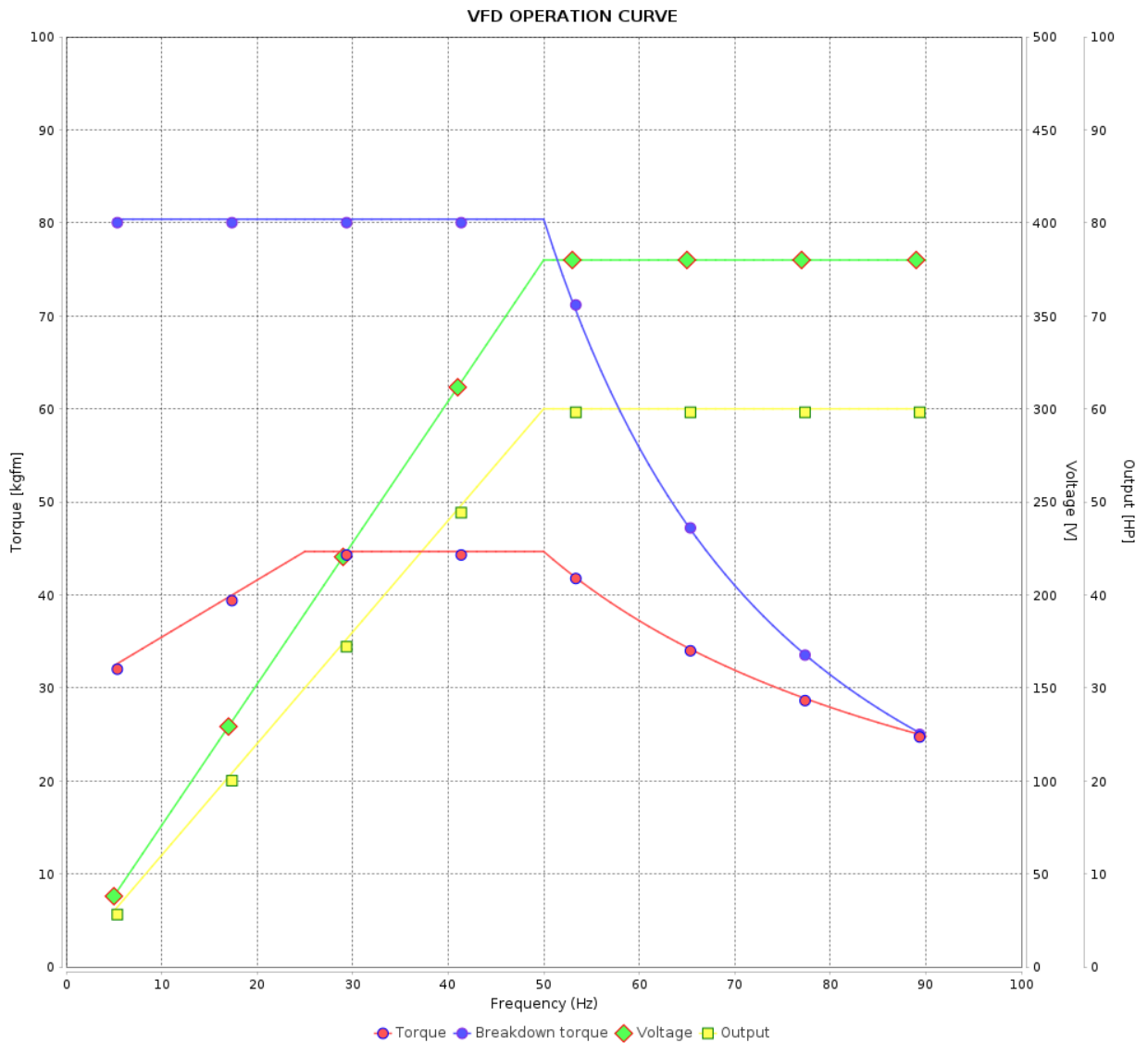


Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase

Product code : 11431398

Catalog # : 06012ST3QIE404T-W22



Performance : 380 V 50 Hz 6P IE1

Rated current : 85.1 A
 LRC : 5.0
 Rated torque : 44.7 kgfm
 Locked rotor torque : 150 %
 Breakdown torque : 180 %
 Rated speed : 975 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.00
 Temperature rise : 105 K
 Design : B

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VFD OPERATION CURVE

Three Phase Induction Motor - Squirrel Cage

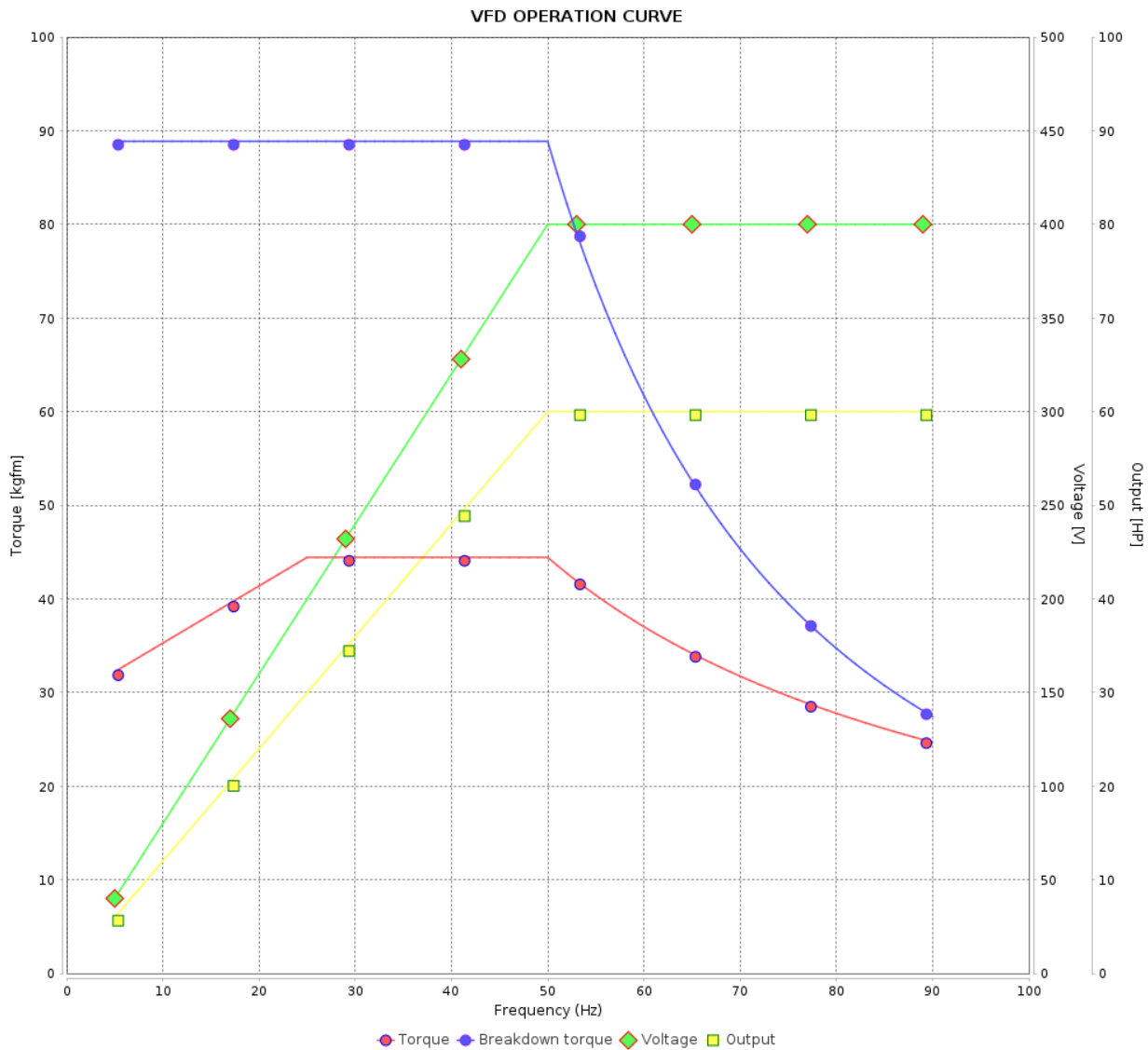


Customer :

Product line : W22 IEEE 841 NEMA Premium Efficiency Three-Phase

Product code : 11431398

Catalog # : 06012ST3QIE404T-W22



Performance : 400 V 50 Hz 6P IE2

Rated current : 80.3 A
 LRC : 5.5
 Rated torque : 44.4 kgfm
 Locked rotor torque : 180 %
 Breakdown torque : 200 %
 Rated speed : 980 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.00
 Temperature rise : 80 K
 Design : B

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VFD OPERATION CURVE

Three Phase Induction Motor - Squirrel Cage

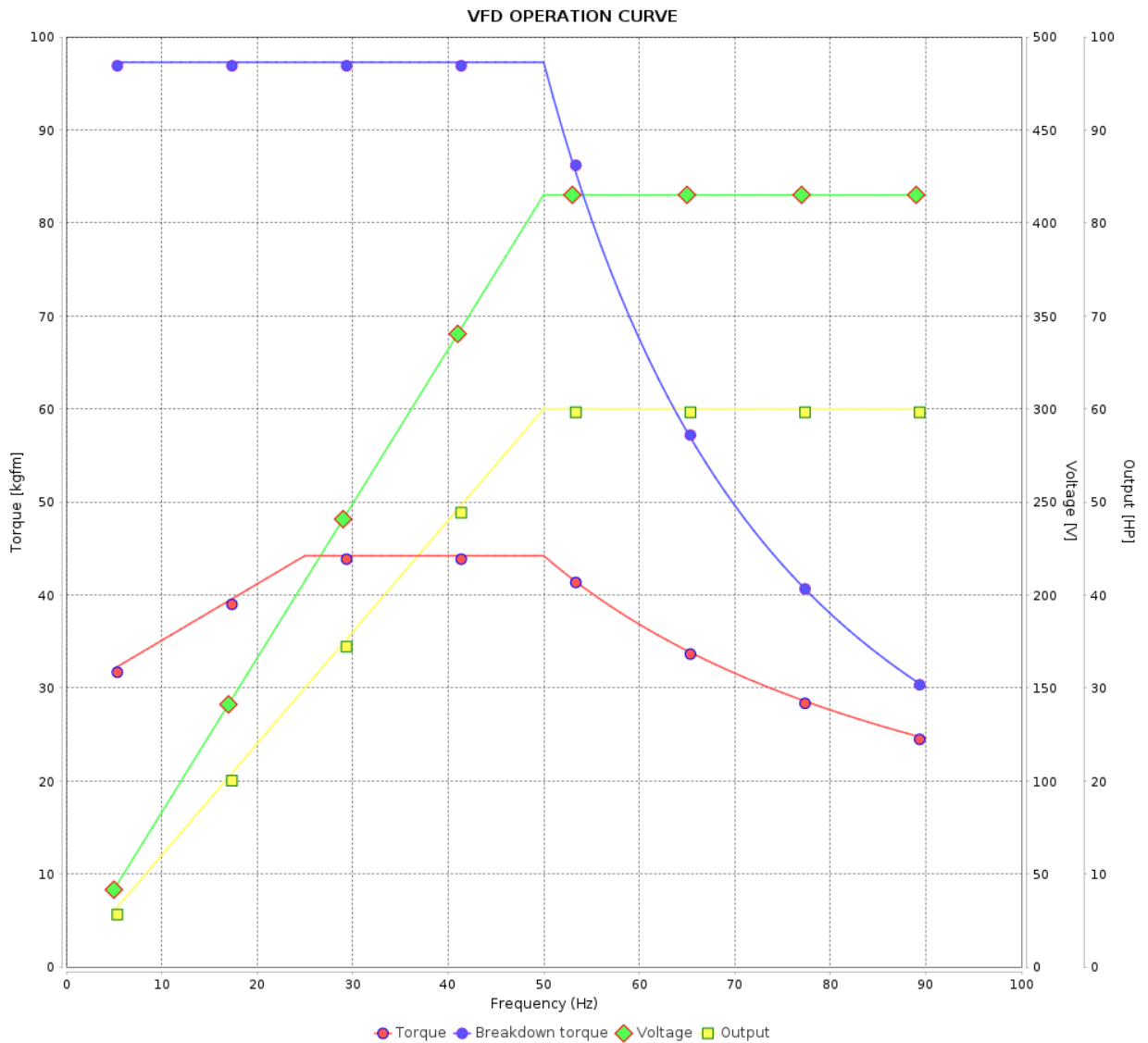


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Product code : 11431398

Catalog # : 06012ST3QIE404T-W22



Performance : 415 V 50 Hz 6P IE2

Rated current : 78.3 A
 LRC : 6.0
 Rated torque : 44.2 kgfm
 Locked rotor torque : 190 %
 Breakdown torque : 220 %
 Rated speed : 985 rpm

Moment of inertia (J) : 1.55 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.00
 Temperature rise : 80 K
 Design : B

| Rev. | Changes Summary | Performed | Checked | Date |
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