

## OUTPUT POWER MEASUREMENT

### Bulletin 1352

Parameter 203 **P\_ACT** Filtered Actual Value of Active Power.

- Scaling: 0.1% (  $P\_ACT = IRE\_FILT * U\_ACT / 1000$  )

Parameter 201 **IRE FILT** Filtered actual value of the output current active component.

- Scaling: 0.1% ( 1000 corresponds to the rated value of the inverter's active component when  $\cos\phi = 0.87$  )

Parameter 204 **U\_ACT** Filtered actual value of output voltage.

-Scaling: 0.1% ( 1000 corresponds to the rated value of the output voltage )

**COS\_PHI** Power factor, the inverter assumes a 0.87  $\cos\phi$  in its calculations

**cos  $\phi$**

**CPS\_FII**

**I<sub>ns</sub>** = Inverter rated output current.

**P<sub>n</sub>** = Rated power in kilowatts.

**N<sub>n</sub>** = Rated speed in rpm

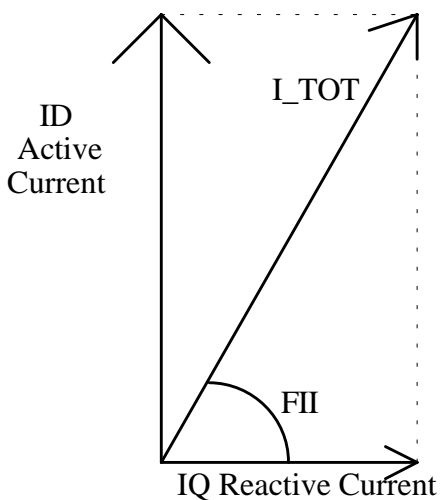
**I<sub>nm</sub>** = Motor rated full load amps.

**U<sub>n</sub>** = Rated voltage.

**IRE<sub>nm</sub>** = Motor nominal reactive current.

Output power measurement in scalar control software SAFRSC 4.04

Output power calculation is based on calculation of the reactive current component (ID).



Used formulas:

$$COS\_FII: 206T \quad COS\_FII = \frac{ID * 1000}{I\_TOT}$$

$$IRE 201T \quad IRE = ID * 1000$$

$$IRE = \frac{\quad}{870}$$

$$I_{TOT} = \sqrt{I_D^2 + I_Q^2}$$

$$P_{ACT} = \frac{IRE \cdot U_{ACT}}{1000}$$

Following assumption is made for the power P\_ACT 203T calculation:

- Power factor of the motor (cos fii) is 0,87.
- Nominal current of the motor is same as nominal current of the SAMI STAR.

POWER actual value scaling for the CP1 display and analog output:

Example: SAMI STAR 200 F 690  $I_{ns} = 167 \text{ A}$   
 Motor  $P_n = 132 \text{ KW}$   
 $N_n = 1485 \text{ rpm}$   
 $I_{nm} = 138.8 \text{ A}$   
 $U_n = 690 \text{ V}$   
 $\text{Cos fii} = 0.85(850)$

Reactive current  $IRE_{nm}$  corresponds to nominal reactive current of the motor

$$IRE_{nm} = \frac{I_{nm} \cdot 1000 \cdot \text{COS\_FII}}{I_{ns} \cdot 870}$$

Output power P\_ACT corresponds to nominal power of the motor

$$P_{ACT} = \frac{IRE_{nm} \cdot U_{ACT}}{1000}$$

$$P_{ACT} = \frac{812 \cdot 1000}{1000} = 812$$

CP1 DISPLAY, KW

P203 = 812 corresponds to nominal power of the motor (132 KW)  
 MUL = 1320  
 DIV = 812  
 POINT = 1 (point = 1 means divide by 10)

ANALOG OUTPUT 2, 4...20 mA

4 mA = 0 KW  
 20 mA = 132 KW  
 MODE = 3  
 MUL = 4095  
 DIV = 1624 (=2\*812)  
 MIN = 0

ACCURACY of the power calculation is +/- 12 % (see appendix 1).