

**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_{ns} = Inverter rated output current.

P_n = Rated power in kilowatts.

N_n = Rated speed in rpm

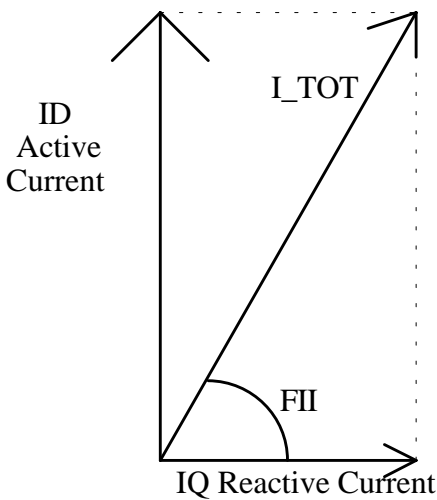
I_{nm} = Motor rated full load amps.

U_n = Rated voltage.

IRE_{nm} = 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).