



TECHNICAL INFORMATION

TITLE: MPU-16A — AMMETER AND UNBALANCE FLUCTUATIONS WITH VFD'S

1. The MPU-16A was designed for fixed-frequency applications; however, the MPU-16A can be applied in variable-frequency applications to provide both thermal (I^2t) and RTD protection. In a variable-frequency application, waveform sampling is not synchronized and the ammeter and unbalance readings will fluctuate. The magnitude of the fluctuation is a function of frequency:

FREQUENCY (Hz)	MPU AMMETER FLUCTUATION	UNBALANCE FLUCTUATION
10	-2%, +3%	35%
20	-4%, +8%	18%
30	+1%, +6%	15%
40	+0, +5%	14%
50	+1, +6%	10%
60	-2%, +1%	3%

The unbalance trip-time delay is 5 seconds and the alarm-time delay is at 1 second. Increase the unbalance set points to avoid false tripping due to fluctuations.

2. The thermal model remains active for all values of motor current. Ammeter fluctuations result in a slight increase in I^2t . A service-factor setting increase of 5% will compensate for this.
3. A PTC or RTD sensor is recommended in VFD applications; however, the electrical noise in VFD applications can affect RTD temperature sensing circuits. Revision 13 or greater MPU-16A's have additional temperature-circuit filtering for VFD applications.
4. CT-primary ratings must be between $1.07 \times \text{FLA}$ and $2.22 \times \text{FLA}$. Select the highest CT-primary rating allowed to keep secondary currents low and minimize CT saturation at low frequency.

DATE	REV	AUTHOR	DOCUMENT LOCATION	PAGE
1996-Jul-16	1	MV	http://www.startco.ca/library/techinfo/section4/4.4.pdf	1 of 2



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5. Mode Summary:

MODE COMMENTS

0	ACTIVE
1	ACTIVE. Overcurrent protection is also provided by the VFD.
2	ACTIVE
3	ACTIVE. Set above the maximum fluctuation expected is a 5-second interval.
4	ACTIVE. Rev. 13 MPU-16A recommended.
5	ACTIVE
6	FLA setting.
7	SF setting. Set 5% higher.
8	Disable phase reverse.
9	Ammeter reading will fluctuate.
A	Peak ammeter will read the peak running current plus the ammeter fluctuation. Ammeter fluctuations will affect percent current modulation.
B	Unbalance reading will fluctuate.
C	Temperature reading. (RTD)
D	Earth-leakage reading will fluctuate.
E	Percent I ² t reading.
F	Primary CT ratings.

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1996-Jul-16	1	MV	http://www.startco.ca/library/techinfo/section4/4.4.pdf	2 of 2