

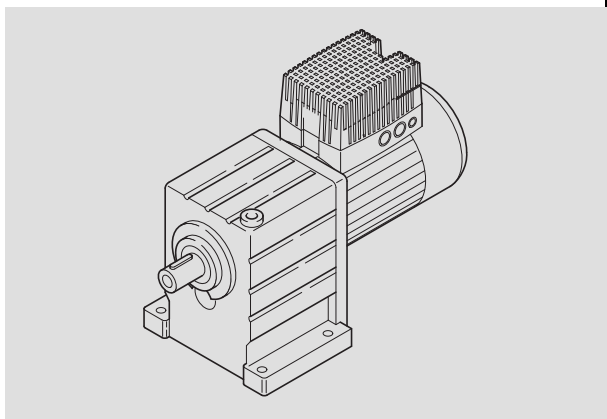


Montageanleitung

Mounting Instructions

Instructions de montage

8200 motec *0.25 ... 7.5 kW*



E82MV251_2Bxxx ... E82MV752_4Bxxx

Frequenzumrichter 8200 motec

Anhang: Einsatz in UL-approbierten Anlagen

8200 motec frequency inverters

Appendix: Use in UL-approved systems

Convertisseur de fréquence 8200 motec

Annexe : Utilisation dans des installations

homologuées UL



Warnings!

- ▶ **Motor Overload Protection**
 - For information on the protection level of the internal overload protection for a motor load, see the corresponding manuals or software helps.
 - If the integral solid state motor overload protection is not used, external or remote overload protection must be provided.
- ▶ **Branch Circuit Protection**
 - The integral solid state protection does not provide branch circuit protection.
 - Branch circuit protection has to be provided externally in accordance with corresponding instructions, the National Electrical Code and any additional codes.
- ▶ If mounted on a motor the environmental rating tests for Type 4 and Type 12 shall be performed.
- ▶ **Fuses/circuit breakers**
 - See this manual for maximum fuse/circuit breaker sizes and circuit breaker types.
 - Voltage rating of the fuses and circuit breakers must at least be suitable for the input voltage.
- ▶ **E82MV251_2B ... E82MV371_2B (0.25 kW ... 0.37 kW, 240 V devices):**
 - Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 240 V maximum, when protected by fuses or circuit breakers.
 - Suitable for use on a circuit capable of delivering not more than 50000 rms symmetrical amperes, 240 V maximum, when protected by CC, J, T or R class fuses.
 - Maximum surrounding air temperature: 0 ... +60 °C
 - > +40 °C: reduce the rated output current by 2.5 %/°C
 - Use 60/75 °C or 75 °C copper wire only.
- ▶ **E82MV551_4B ... E82MV752_4B (0.55 kW ... 7.5 kW, 400/500 V devices):**
 - Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 500 V maximum, when protected by fuses or circuit breakers.
 - Circuit breakers only for use in WYE 480/277V source.
 - Suitable for use on a circuit capable of delivering not more than 50000 rms symmetrical amperes, 500 V maximum, when protected by CC, J, T or R class fuses.
 - Maximum surrounding air temperature: 0 ... +60 °C
 - > +40 °C: reduce the rated output current by 2.5 %/°C
 - Use 60/75 °C or 75 °C copper wire only.

Motor thermisch überwachen

Beschreibung

Mit der I²t-Überwachung können Sie eigenbelüftete Drehstrommotoren sensorlos thermisch überwachen.



Hinweis!

Die I²xt-Funktion ist UL-approbiert.

- ▶ Die I²xt-Überwachung basiert auf einem mathematischen Modell, das aus den erfassten Motorströmen eine thermische Motorauslastung berechnet.
- ▶ In UL-approbierten Anlagen sind keine zusätzlichen Schutzmaßnahmen für den Motor erforderlich.
- ▶ Die I²xt-Überwachung ist trotzdem **kein** Motorvollschutz, da andere Einflüsse auf die Motorauslastung nicht erfasst werden können, wie veränderte Kühlungsbedingungen (z. B. Kühlluftstrom unterbrochen oder zu warm).
- ▶ Einen Motorvollschutz können Sie nur erreichen, wenn der Motor mit einem PTC-Widerstand oder einem Thermokontakt ausgerüstet ist.

Codes für die Parametrierung

Code		Einstellmöglichkeiten			WICHTIG	
Nr.	Bezeichnung	Lenze	Auswahl			
C0120	I ² t-Abschaltung	0	0 = inaktiv	{1 %}	200	Bezug: Motor-Scheinstrom (C0054) Bezug auf Motor-Wirkstrom (C0056) möglich, siehe C0310

Abgleich

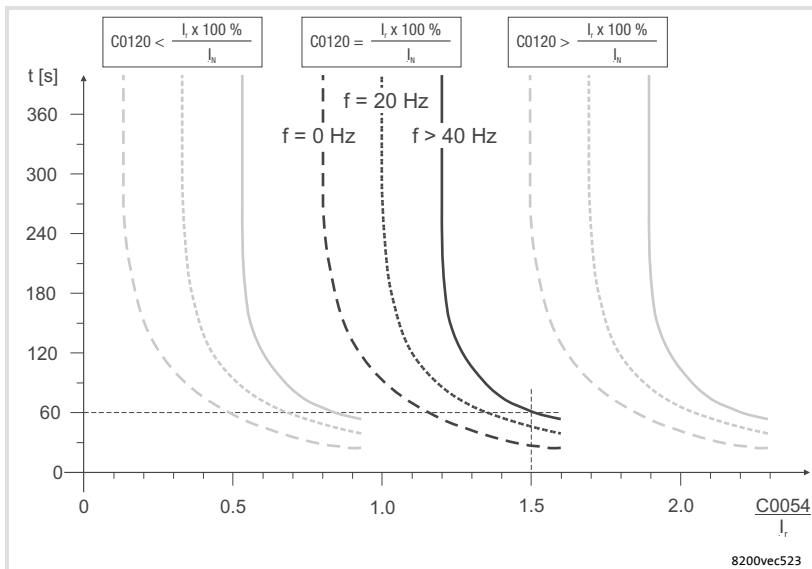
1. Berechnen Sie C0120. Dieser Wert entspricht 100 % Motorauslastung:

$$C0120 [\%] = \frac{I_r}{I_N} \cdot 100 \%$$

I_r Motor-Bemessungsstrom
 I_N Antriebsregler-Bemessungsstrom bei Schaltfrequenz 8 kHz

2. Wenn Sie C0120 ausgehend vom berechneten Wert verringern, spricht die Überwachung schon bei Motorauslastung < 100 % an.
3. Wenn Sie C0120 ausgehend vom berechneten Wert vergrößern, spricht die Überwachung erst bei Motorauslastung > 100 % an.

Der Antriebsregler schaltet mit dem Fehler OC6 ab, wenn der Motor-Scheinstrom längere Zeit größer ist als der Motor-Nennstrom.



f	Ausgangsfrequenz
t	Auslösezeit
I_N	Antriebsregler-Bemessungsstrom bei Schaltfrequenz 8 kHz
I_r	Motor-Bemessungsstrom
C0054	Motor-Scheinstrom

Beispiel:

$$C0120 = \frac{I_r}{I_N} \cdot 100 \%$$

C0054 = 1.5 x Motor-Bemessungsstrom

Der Antriebsregler schaltet bei Ausgangsfrequenzen $f > 40$ Hz nach ca. 60 s mit Fehler OC6 ab.

Einstelltipps

- ▶ Um bei fremdbelüfteten Motoren ein vorzeitiges Ansprechen zu verhindern, ggf. die Funktion deaktivieren.
- ▶ Die Stromgrenzen C0022 und C0023 haben auf die I²t-Berechnung nur indirekten Einfluss. Sie können aber mit den Einstellungen von C0022 und C0023 den Betrieb des Motors mit maximal möglicher Auslastung verhindern.



Hinweis!

Bei Betrieb des Antriebsreglers mit erhöhter Bemessungsleistung kann die I²t-Überwachung ansprechen, wenn C0120 kleiner 100 % eingestellt wird.

Sicherungen und Leitungsquerschnitte nach UL

Anschlussbedingungen	
Bereich	Beschreibung
Sicherungen	<ul style="list-style-type: none"> Nur nach UL 248 Netz-Kurzschlussstrom bis 5000 A_{rms} : Alle Klassen zulässig Netz-Kurzschlussstrom bis 50000 A_{rms} : Nur Klasse "CC", "J", "T" oder "R" zulässig
Leitungen	<ul style="list-style-type: none"> Nur nach UL Die nachfolgend genannten Leitungsquerschnitte gelten unter folgenden Bedingungen: <ul style="list-style-type: none"> Leitertemperatur < 60 °C Umgebungstemperatur < 40 °C

Nationale und regionale Vorschriften beachten!

8200 motec	Sicherungs-Bemessungsstrom / Leitungsquerschnitt				
	Schmelzsicherung		Leitungsschutzschalter		
	max. Strom [A]	L1, L2, L3, N, PE [AWG]	max. Strom [A]	Typ	L1, L2, L3, N, PE [AWG]
Typ					
Netz 1/N/PE AC 230/240 V					
E82MV251_2B	10	16	15	①②③④⑤⑥	14
E82MV371_2B	10	16	15		14
Netz 3/PE AC 400/500 V					
E82MV551_4B	6	18	15	②③⑤⑥	14
E82MV751_4B	6	18	15		14
E82MV152_4B	10	16	15		14
E82MV222_4B	20	12	20		12
E82MV302_4B	20	12	20	②③⑤⑥	12
E82MV402_4B	20	12	20		12
E82MV552_4B	25	10	25		10
E82MV752_4B	35	8	35	②	8

- ① Siemens 5SJ4...-7HG41, Characteristic C
- ② Siemens 5SJ4...-7HG42, Characteristic C
- ③ Moeller FAZ-C, Characteristic C
- ④ ABB S200U, Characteristic K
- ⑤ ABB S200UP, Characteristic K
- ⑥ Schneider Electric Multi9 C60, Characteristic C



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- ▶ **Fuses/circuit breakers**
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 - Voltage rating of the fuses and circuit breakers must at least be suitable for the input voltage.
- ▶ **E82MV251_2B ... E82MV371_2B (0.25 kW ... 0.37 kW, 240 V devices):**
 - Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 240 V maximum, when protected by fuses or circuit breakers.
 - Suitable for use on a circuit capable of delivering not more than 50000 rms symmetrical amperes, 240 V maximum, when protected by CC, J, T or R class fuses.
 - Maximum surrounding air temperature: 0 ... +60 °C
 - > +40 °C: reduce the rated output current by 2.5 %/°C
 - Use 60/75 °C or 75 °C copper wire only.
- ▶ **E82MV551_4B ... E82MV752_4B (0.55 kW ... 7.5 kW, 400/500 V devices):**
 - Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 500 V maximum, when protected by fuses or circuit breakers.
 - Circuit breakers only for use in WYE 480/277V source.
 - Suitable for use on a circuit capable of delivering not more than 50000 rms symmetrical amperes, 500 V maximum, when protected by CC, J, T or R class fuses.
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 - > +40 °C: reduce the rated output current by 2.5 %/°C
 - Use 60/75 °C or 75 °C copper wire only.

Thermal motor monitoring

Description

With the I²t monitoring you can monitor self-ventilated three-phase AC motors thermally without sensors.



Note!

The I²t function is UL-approved.

- ▶ The I²t monitoring is based on a mathematical model which calculates a thermal motor utilisation from the motor currents measured.
- ▶ In UL-approved systems no additional protective measures for the motor are required.
- ▶ However, the I²t monitoring is **no** full motor protection, since other influences on the motor utilisation cannot be detected, like changed cooling conditions (e.g. cooling air flow interrupted or too warm).
- ▶ You can only obtain full motor protection if the motor is equipped with a PTC thermistor or a thermal contact.

Codes for parameter setting

Code		Possible settings			IMPORTANT
No.	Name	Lenze	Selection		
C0120	I ² t switch-off	0	0 = inactive	{1 %}	200 Reference: apparent motor current (C0054) Reference to active motor current (C0056) possible, see C0310

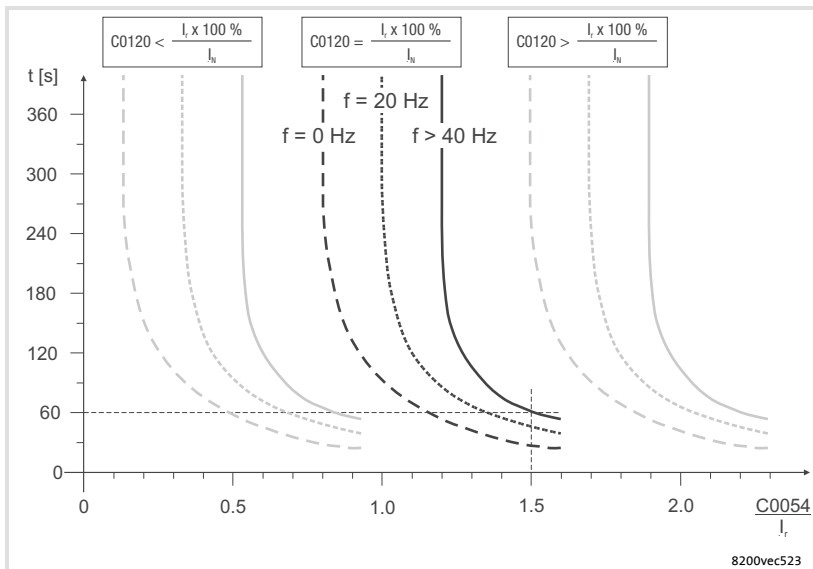
Adjustment

1. Calculate C0120. This value corresponds to a motor utilisation of 100 %:

$$C0120 [\%] = \frac{I_r}{I_N} \cdot 100 \% \quad \begin{array}{l} I_r \text{ Rated motor current} \\ I_N \text{ Rated controller current at switching frequency 8 kHz} \end{array}$$

2. If you decrease C0120 on the basis of the value calculated, the monitoring already responds at a motor utilisation < 100 %.
3. If you increase C0120 on the basis of the value calculated, the monitoring only responds at a motor utilisation > 100 %.

The controller switches off with error OC6 if the apparent motor current is greater than the rated motor current for a longer time.



f	Output frequency
t	Release time
I_N	Rated controller current at switching frequency 8 kHz
I_r	Rated motor current
C0054	Apparent motor current

Example:

$$C0120 = \frac{I_r}{I_N} \cdot 100 \%$$

C0054 = 1.5 x rated motor current

The controller switches off at output frequencies $f > 40$ Hz with error OC6 after approx. 60 s.

Setting tips

- ▶ To avoid an early response in the case of forced ventilated motors, deactivate the function, if necessary.
- ▶ The current limits C0022 and C0023 only have an indirect effect on the I^2t calculation. However, you can prevent the motor from being actuated at the maximum possible utilisation by the settings of C0022 and C0023.



Note!

If the controller is actuated at an increased rated power, the I^2t monitoring can respond if C0120 is set to a smaller value than 100 %.

Fuses and cable cross-sections according to UL

Supply conditions	
Range	Description
Fuses	<ul style="list-style-type: none"> Only in accordance with UL 248 System short-circuit current up to 5000 A_{rms} : All classes are permissible System short-circuit current up to 50000 A_{rms} : Only classes "CC", "J", "T" or "R" permissible
Cables	<ul style="list-style-type: none"> Only in accordance with UL The cable cross-sections specified in the following apply under the following conditions: <ul style="list-style-type: none"> Conductor temperature < 60 °C Ambient temperature < 40 °C

Observe all national and regional regulations!

8200 motec	Rated fuse current / cable cross-section				
	Fuse		Circuit-breaker		
	max. current [A]	L1, L2, L3, N, PE [AWG]	max. current [A]	Type	L1, L2, L3, N, PE [AWG]
Type					
Mains 1/N/PE AC 230/240 V					
E82MV251_2B	10	16	15	①②③④⑤⑥	14
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Mains 3/PE AC 400/500 V					
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E82MV152_4B	10	16	15		14
E82MV222_4B	20	12	20		12
E82MV302_4B	20	12	20	②③⑤⑥	12
E82MV402_4B	20	12	20		12
E82MV552_4B	25	10	25		10
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 - Use 60/75 °C or 75 °C copper wire only.
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 - Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 500 V maximum, when protected by fuses or circuit breakers.
 - Circuit breakers only for use in WYE 480/277V source.
 - Suitable for use on a circuit capable of delivering not more than 50000 rms symmetrical amperes, 500 V maximum, when protected by CC, J, T or R class fuses.
 - Maximum surrounding air temperature: 0 ... +60 °C
 - > +40 °C: reduce the rated output current by 2.5 %/°C
 - Use 60/75 °C or 75 °C copper wire only.

Surveillance de la température du moteur

Description

La surveillance I²t permet de surveiller thermiquement des moteurs triphasés autoventilés sans l'aide d'un capteur.



Remarque importante !

La fonction I²t est homologuée UL.

- ▶ La surveillance I²t est basée sur un modèle mathématique qui calcule une charge moteur thermique à partir des courants moteur détectés.
- ▶ Dans les installations homologuées UL, aucune mesure de protection supplémentaire n'est requise pour le moteur.
- ▶ La surveillance I²t n'offre cependant **pas** une protection totale du moteur, car elle ne permet pas de détecter d'autres incidences sur la charge moteur telles que la modification des conditions de refroidissement (par exemple : air de refroidissement interrompu ou trop chaud).
- ▶ La protection totale peut uniquement être atteinte si le moteur est équipé d'une résistance PTC ou d'un contact thermique.

Codes de paramétrage

Code		Réglages possibles			IMPORTANT	
N°	Désignation	Lenze	Choix			
C0120	Déconnexion I ² t	0	0 = désactivé	{1 %}	200	Référence : courant apparent moteur (C0054) Référence au courant efficace moteur (C0056) possible, voir C0310

Réglage

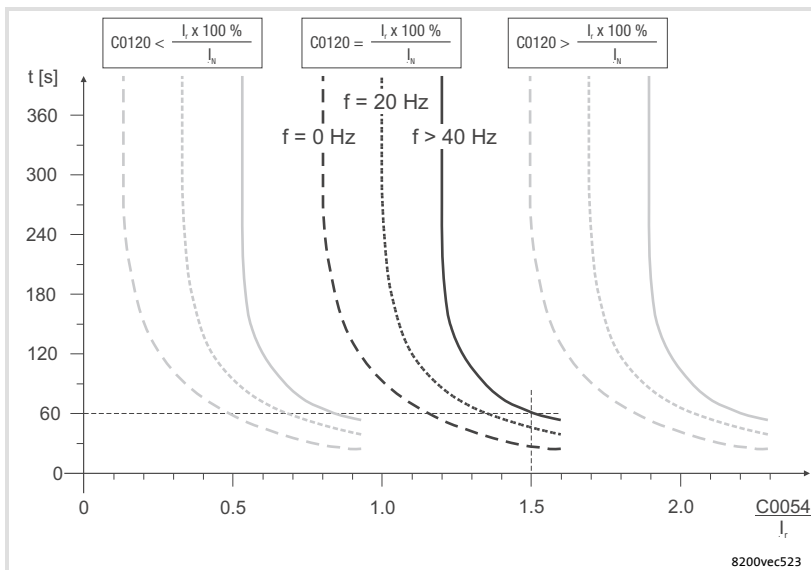
1. Calculer C0120. Cette valeur correspond à 100 % de la charge moteur :

$$C0120 [\%] = \frac{I_r}{I_N} \cdot 100 \%$$

I_r Courant moteur assigné
 I_N Courant assigné du variateur pour une fréquence de découpage de 8 kHz

2. Si vous réduisez C0120 en partant de la valeur calculée, la fonction de surveillance se déclenche dès que la charge moteur est < 100 %.
3. Si vous augmentez C0120 en partant de la valeur calculée, la fonction de surveillance se déclenche seulement lorsque la charge moteur est > 100 %.

Le variateur s'arrête en émettant l'erreur OC6 si le courant apparent moteur est supérieur au courant moteur assigné pendant une période prolongée.



f	Fréquence de sortie
t	Temps de déclenchement
I_N	Courant assigné du variateur pour une fréquence de découpage de 8 kHz
I_r	Courant moteur assigné
C0054	Courant apparent moteur

Exemple :

$$C0120 = \frac{I_r}{I_N} \cdot 100 \%$$

C0054 = 1.5 x courant moteur assigné

Pour des fréquences de sortie $f > 40$ Hz, le variateur s'arrête au bout de 60 s env. en émettant l'erreur OC6.

Recommandations de réglage :

- ▶ Pour éviter un déclenchement précoce avec des moteurs motoventilés, désactiver éventuellement la fonction.
- ▶ Les limitations de courant C0022 et C0023 n'ont qu'une incidence indirecte sur le calcul I^2t . Les réglages de C0022 et C0023 permettent toutefois d'empêcher le fonctionnement du moteur à la charge maximale possible.



Remarque importante !

En cas de fonctionnement du variateur avec puissance assignée accrue, la surveillance I^2t peut se déclencher si C0120 est réglé sur une valeur inférieure à 100 %.

Fusibles et sections de câble selon la norme UL

Conditions électriques	
Plage	Description
Fusibles	<ul style="list-style-type: none"> • Uniquement selon UL 248 • Courant de court-circuit réseau jusqu'à 5000 A_{rms} : toutes les classes sont admissibles • Courant de court-circuit réseau jusqu'à 50 000 A_{rms} : seules les classes "CC", "J", "T" ou "R" sont admissibles
Câbles	<ul style="list-style-type: none"> • Uniquement selon UL • Les sections de câble indiquées ci-dessous ne sont valables que dans les conditions suivantes : <ul style="list-style-type: none"> – Température du conducteur < 60 °C – Température ambiante < 40 °C

Tenir compte des réglementations nationales et régionales en vigueur !

8200 motec	Courant assigné fusible / section de câble				
	Fusible		Disjoncteur de protection de circuit		
	Courant max. [A]	L1, L2, L3, N, PE [AWG]	Courant max. [A]	Type	L1, L2, L3, N, PE [AWG]
Réseau 1/N/PE AC 230/240 V					
E82MV251_2B	10	16	15	①②③④⑤⑥	14
E82MV371_2B	10	16	15		14
Réseau 3/PE AC 400/500 V					
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E82MV751_4B	6	18	15		14
E82MV152_4B	10	16	15		14
E82MV222_4B	20	12	20		12
E82MV302_4B	20	12	20	②③⑤⑥	12
E82MV402_4B	20	12	20		12
E82MV552_4B	25	10	25		10
E82MV752_4B	35	8	35	②	8

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