

## Ratings and specifications

This certificate is valid for the following designs, provided the motors of this type differ only negligibly from the sample tested as regards electrical and thermal stresses:

### Star connection

Torque:	20	40	40	20	Nm
Power:	0.272	2.95	6.1	5.3	kW
Voltage: *)	40	200	400	400	V
Current:	7.8	12.7	12.9	10.8	A
Frequency:	5	25	50	87	Hz
Speed:	127	706	1458	2542	min <sup>-1</sup>
Duty type:			S1		
Temperature class:			F		

### Delta connection

Torque:	20	40	40	40	Nm
Power:	0.272	2.95	6.1	10.75	kW
Voltage: *)	23	115	230	400	V
Current:	13.5	22	22.3	23	A
Frequency:	5	25	50	87	Hz
Speed:	127	706	1458	2563	min <sup>-1</sup>
Duty type:			S1		
Temperature class:			F		

\*) Fundamental wave, measured at motor terminals.

The voltage depends on the converter input voltage, the voltage drop at the filter and across the motor connection cable. Even at minimum converter input voltage, it must not remain by more than 5% below the rating, as specified in IEC 60034 – 1 (area "A"). This has to be considered in designing the motor, in converter parameterization (e.g. U/f adaptation), and at minimum converter input voltage. The maximum converter input voltage is 500 V.

The rated motor voltage may be adjusted by the number of turns per unit length of the winding. The rated current changes at a ratio which is the reciprocal of the rated voltage.

## Monitoring device

A device for direct temperature monitoring, combined with defined converter settings, protect the motors against excessive heating as a result of overloading.

Because of the special features of converter-fed motors and the adapted monitoring device, the  $I_A/I_N$  ratio and the heating times  $t_E$  need not be specified.

The device for direct temperature monitoring has been type tested by Physikalisch-Technische Bundesanstalt. It consists of three DIN 44082 PTC thermistors, type S 130, which are embedded in the winding, and a tripping device that has been function-tested for this purpose on the basis of Directive 94/9/EC.

At a phase current of 87.7 A and a blocked shaft, the PTC thermistor must trip after 40.4 s ( $\pm 20\%$ ) when starting from the cold state (20 °C).

Because of the temperature monitoring device, temperature class **T3** is complied with on the basis of EN 60079-7.

## Converter settings

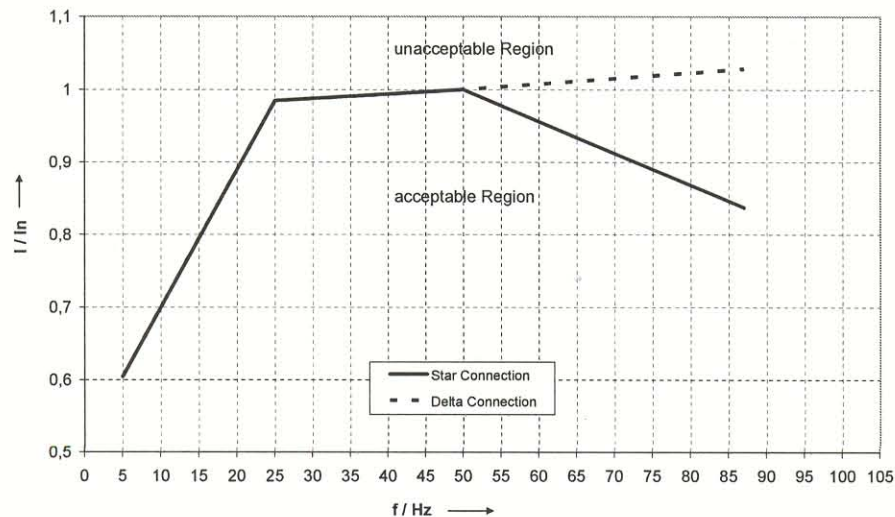
In connection with the above monitoring device, the converter has to be set as follows, and these settings must be maintained during operation:

Minimum clock frequency:	3	kHz
Motor current (short-term):	$1.5 \cdot I_N$	
Maximum overload period:	60	s
Minimum frequency $f_{\min}$ :	5	Hz
Maximum frequency $f_{\max}$ :	87	Hz
Permissible period of operation below $f_{\min}$ :	60	s

The maximum overload period and the permissible period for operation below  $f_{\min}$  are based on a 10-minute time interval.

The torque as a function of frequency follows from the permissible continuous-current limit.

The continuous-current limit of the frequency converter has to be adjusted as a function of the frequency in compliance with the graph below:



Setting parameters for continuous-current limit of the frequency converter between 5 Hz and 87 Hz

All other settings have to be selected as required for the drive conditions.

### Special conditions

Group operation of the motor is not accepted.

Motors of this type may only be operated with converters that meet the requirements defined above under “converter settings”.

The rated current of the frequency converter may as a maximum be two times the rated motor current.

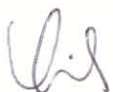
The current monitoring device for the frequency converter must record the r.m.s. machine current at a tolerance of  $\pm 5\%$  based on the rated motor current.

Before starting the system, due care must be taken that no converter-induced overvoltage with peaks greater than  $1556 \text{ V}$  ( $2 \cdot \sqrt{2} \cdot 550 \text{ V}$ ) can occur at the terminals of the electric machine.

Test report PTB Ex 07-37440

Zertifizierungsstelle Explosionsschutz

By order



Dr.-Ing. F. Lienesch  
Regierungsdirektor



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