Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 99 ATEX 1114

(4) Equipment: Three-phase motors of types DEx 80 . to 132 .

(5) Manufacturer: HERFORDER ELEKTROMOTOREN-WERKE GmbH & Co.

(6) Address: 32051 Herford, Goebenstraße 106

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 99-19176.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1997 **EN 50018:1994** **EN 50019:1994**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

II 2 G EEx d IIC T4 resp. EEx de IIC T4

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, September 13, 1999

(signature)

Dr.-Ing. H. Wehinger
Direktor und Professor

6 pages, correct and complete as regards content.
By order

Dr.-Ing. Klausmeyer
Regierungsdirektor

Braunschweig, November 13, 2000

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(13) # S C H E D U L E

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

(15) Description of equipment

The three-phase motors consist of cast iron casings, which are closed with shaft and an end shield at the non-drive end. At the non-drive end accommodates an external fan, which is protected by a hood.

The electrical connection is via separate terminal boxes of the Flameproof Enclosure or Increased Safety type of protection. The electrical connection between terminal box and motor compartment is ensured by a bushing, which is in the scope of this certificate.

To comply with the temperature class, the three-phase motors will be provided with three temperature sensors arranged in the winding and a suitable electronic cut-off device.

According to type and construction, the three-phase motors may be designed within the following technical data:

Permissible ambient temperature range	from -20 °C to 40 °C (normal)
Special model	from -50 °C to 60 °C
Operation modes [EN 60034:1998]	S1 to S10 and frequency converter operation
Rated voltages	380 V to 690 V ±10 % AC
Rated frequencies	50 Hz / 60 Hz
Rated powers	0.14 kW to 7.5 kW
Rated rotations (S1 to S10)	500 1/min to 3600 1/min
Frequency converter operation	150 1/min to 3600 1/min
Nominal Cut-off temperature of the PTC's	145 °C

(16) Test report PTB Ex 99-19176

(17) Special conditions for safe use

Not applicable

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

(18) Essential health and safety requirements

Met by the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, September 13, 1999

(signature)

Dr.-Ing. H. Wehinger
Direktor und Professor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

(Translation)

Equipment: Three-phase motors of types DEx 80 . to DEx 132 .

Marking: ⟨Ex⟩ **II 2G EEx d IIC T4 resp. EEx de IIC T4**

Manufacturer: HERFORDER ELEKTROMOTOREN-WERKE GmbH & Co

Address: Goebenstraße 106
32051 Herford

Description of supplements and modifications

The three-phase motors are increased of the types DEx 71 . and DEx 160 .

The three-phase motors of the types DEx 71 . and DEx 160 . in Flameproof Enclosure type of protection consist of a cast iron casing which is closed with end shields at the drive and non-drive ends in the case of types DEx 160 and only at the non-drive end in the case of types DEx 71. The shaft, which is, equipped with ball bearings forms flameproof joints both with the casing and with the end shields. To cool the three-phase motors, the non-drive end accommodates an external fan, which is protected by a hood.

The electrical connection is via separate terminal boxes of the Flameproof Enclosure or Increased Safety type of protection. A cable bushing ensures the electrical connection between terminal box and motor compartment.

The three-phase motors can be operated on the mains and on the frequency converter.

To comply with the temperature class, the three-phase motors will be provided with a motor protecting switch and, if necessary, with three temperature sensors arranged in the winding and a suitable electronic cut-off device.

The three-phase motors can be equipped with an anti-condensation heater.

According to type and design, the three-phase motors may be designed within the following technical data:

Terminal box of type of protection	Permissible ambient temperature range
Flameproof enclosure	- 50 °C to 60 °C
Increased safety	- 20 °C to 60 °C

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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

Operation modes [EN 60034:1998]	S1 to S10

	Mains operation	Frequency converter operation
Rated voltages	380 to 690 V AC ±10%	to 565 V AC
Rated frequencies	50 Hz / 60 Hz	from 5 to 87 Hz

Type DEx	71	160
Rated power up to	1.25 kW	18.5 kW

The following hints have to be complied with for installation and operation by the types DEx 71 . and DEx 160 .

Installation

The terminal boxes of the Flameproof Enclosure type of protection must be provided with points of entry, adapters and closing elements which have been certified at least in compliance with the standards EN 50014:1992 and EN 50018:1994.

The terminal boxes of the Increased Safety type of protection must be provided with points of entry, adapters and closing elements which have been certified at least in compliance with the standards EN 50014:1992.

The terminal boxes of the Increased Safety type of protection must **not** be used at an ambient temperature < -20°C.

Operation

In **S1 mains operation**, it is sufficient for the protection of the three-phase motors to provide a function-tested **current-depending protective device** monitoring the three outer conductors. This device which is adjusted to the rated current must switch off the three-phase motors at 1,2 times the rated current within two hours or less. At 1,05 times the rated current, the three-phase motors must not be switched off within two hours.

In **S2 to S10 mains operation and in all duties with frequency converter**, the three-phase motors must be operated at least with three **temperature sensors** (one per phase) and a suitable electronic cut-off device, which have together been tested by a notified body for their function.

If three-phase motors are to be used at an **ambient temperature < -20°C**, they must be equipped with an **anti-condensation heater**.

The anticondensation heater may heat only when the three-phase motors are **not** in operation.

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1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

Test report: PTB Ex 00-10040

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, March 28, 2000

(signature)

Dr.-Ing. Klausmeyer
Regierungsdirektor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2nd SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

(Translation)

Equipment: Three-phase motors of types DEx 71 . to DEx 160 .

Marking: Ⓔx **II 2 G EEx d IIC T4 or EEx de IIC T4**

Manufacturer: HERFORDER ELEKTROMOTOREN-WERKE GmbH & Co

Address: Goebenstr. 106
32051 Herford, Germany

Description of supplements and modifications

The three-phase motors are extended to additionally include types DEx 180, DEx 200 and DEx 225.

The three-phase motors are designed to Flameproof Enclosure type of protection. They have a welded steel housing, which is delimited on the drive- and the non-drive end by end shields. The shaft rotates in rolling bearings. Together with the housing and the end shields, it forms a flameproof joint. Motor cooling is achieved by an external fan, which is protected by a fan cowl.
The motor is electrically connected by means of a terminal box designed to Flameproof Enclosure or Increased Safety type of protection. Electric connection between terminal box and motor compartment is provided by certified bushings.
The three-phase motors may be mains or frequency converter operated.
For compliance with the temperature class, the three-phase motors are provided with a motor protection switch and possibly with three temperature sensors embedded in the winding as well as suitable interrupt electronics.
The three-phase motors may be equipped with an anti-condensation heater.

Depending on their type and design, the three-phase motors may be rated within the following technical limits:

Terminal box, designed to type of protection	Admissible ambient temperatures			
Flameproof Enclosure	-50 °C* to 60 °C			
Increased Safety	-20 °C to 60 °C			
Duty type, in compliance with EN 60034:1998	S1 to S10			
	Mains operation		Frequency converter operation	
Rated voltage	380 V to 690 VAC ±10%		Up to 690 VAC	
Rated frequency	50 Hz / 60 Hz		From 5 to 87 Hz	
Type: DEx	180	200	225	
Rated power up to [kW]	22	37	45	

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2nd SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

The following notes shall be observed for installation and operation of three-phase motors types DEx 71 . to DEx 225 .

- For S1 mains operation, a function-tested current-dependent protection monitoring all three external conductors will suffice for the three-phase motors. This protective equipment, adjusted to match the current rating, has to make sure that the three-phase motors will be stopped at 1.2 times the rated current within 2 hours or shorter. At 1.05 times the rated current, the three-phase motors must not be stopped within this 2-hour period.
- For S2 to S10 mains operation and all duty types under frequency converter operation, the three-phase motors have to be provided with no less than three temperature sensors (one sensor for each phase) and suitable stopping electronics, which has been function-tested by a notified body.
- If the three-phase motors are to be exposed to ambient temperatures < -20 °C, they have to be provided with an anti-condensation heater. This anti-condensation heater has to heat the motors to a minimum temperature of -20 °C, while making sure that the maximum admissible ambient temperature will not be exceeded.

  The anti-condensation heater may heat only when the three-phase motors are not in operation.
- The terminal box of Increased Safety type of protection must not be used at ambient temperatures < -20 °C.

  The terminal box may, in addition, only be provided with entries, adapters and sealing plugs that have as a minimum been certified in compliance with EN 50014:1992.
- The terminal box of Flameproof Enclosure type of protection may only be provided with entries, adapters and sealing plugs that have as a minimum been certified in compliance with EN 50014:1992 and EN 50018:1994.

Test report: PTB Ex 01-11175

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Klausmeyer
Direktor und Professor

Braunschweig, 8 August 2001

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3rd SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

(Translation)

Equipment: Three-phase motors of types DEx 71 . to 225 .

Marking: ⟨Ex⟩ **II 2 G EEx d IIC T4-T6 or EEx de IIC T4-T6**

Manufacturer: HERFORDER ELEKTROMOTOREN-WERKE GmbH Co.

Address: Goebenstraße 106, 32051 Herford
Germany

Description of supplements and modifications

The motors may be optionally provided with direct cable entry. In that case, the terminal box will not be required. All direct cable entries have to be glued to the housing.

For motor types DEx 71 . to 160 ., the admissible voltage ratings for mains operation are extended to 110 ... 690 V AC ±10 %.

The motors may be optionally designed for temperature classes T5 and T6.

Test report: PTB Ex 04-13237

Zertifizierungsstelle Explosionsschutz
By order:

Dr. M. Thedens

Braunschweig, 8 October 2004

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 30

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Braunschweig und Berlin

4th SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 1114

(Translation)

Equipment: Three-phase motors of type series DEx 71 . to 160 .

Marking: Ⓔx **II 2 G EEx d IIC T4-T6 and EEx de IIC T4-T6**

Manufacturer: HERFORDER ELEKTROMOTOREN-WERKE GmbH Co.

Address: Goebenstraße 106, 32051 Herford, Germany

Description of supplements and modifications

The type approval is extended to include area II D (dust explosion protection).

The maximum permissible ambient temperature range for this version is -30 °C to 60 °C.

Type name and marking are changed as follows:

Motor types DDEx 71 ./ to DDEx 160 ./ .

Ⓔx **II 2 G EEx d IIC T4 ... T6 and EEx de IIC T4...T6**

Ⓔx **II 2 D IP 6X T 135 °C ... T 85 °C**

Test report: PTB Ex 06-16184

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, 21 September 2006

Dr.-Ing. W. T[illegible]
Regierungsrat

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 30