



(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 01 ATEX 1016

(4) Equipment: Terminal box, type 8146/1...-.. and type 8146/2...-..
(5) Manufacturer: R. STAHL Schaltgeräte GmbH
(6) Address: Am Bahnhof 30, 74638 Waldenburg (Württ.), Germany

(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 01-11019.

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

EN 50014:1997 + A1 + A2 EN 50018:1994 EN 50019:1994
EN 50020:1994 EN 50028:1987

(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 edm ia/ib [ia] IIC/IIB/IIA T6, T5 or T4

Zertifizierungsstelle Explosionsschutz

Braunschweig, June 13, 2001

By order:

Dr.-Ing. U. Klausmeyer
Regierungsdirektor



(13) **SCHEDULE**

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016**

(15) Description of equipment

The terminal box of types 8146/1...-.. and 8146/2...-.. is a polyester-resin housing designed to type of protection increased safety "e". It is used to house terminals for intrinsically safe and non-intrinsically safe circuits and may optionally be provided with disconnect terminals and fuses. The box area intended for intrinsically safe circuits will be marked by a special colour (e.g. light-blue). Connection will be made by means of explosion-proof cable entries.

The enclosure as well as any installed and attached components have been tested and certified under a separate test certificate.

Technical data

Rated voltage*	up to	1100	V
Rated current*	max.	500	A
Rated cross section*	max.	300	mm ²

*) depending on type of terminal and explosion-proof components used

Ambient temperature	depending on temperature class and sealing used
	-20°C to +40°C, T6
	-40°C to +40°C, T6
	-20°C to +55°C, T5
	-40°C to +55°C, T5

The ratings specified are maximum values, actual values will be subject to the electrical equipment used from case to case. Depending on the system conditions, the mode of operation, the utilisation category, etc., the manufacturer will define the definitive ratings which will be within the range of these limiting values and will comply with the relevant standards.

The composition of the protection symbol will be based on the types of protection of the components actually used.

(16) Test report PTB Ex 01-11019

(17) Special conditions for safe use

None;

Notes for installation and use

For the maximum number of conductors, which for each size of enclosure is determined by the cross section and the admissible continuous current, reference is made to the specification sheets.

Equipment of the type of protection Intrinsic Safety "i" shall be installed in such a way that the clearances and creepage distances between intrinsically safe and non-intrinsically safe circuits as set forth in 60079-14 are duly accounted for.

If the clearance requirements for the connectors as specified in EN 50020 cannot be safeguarded with the system installation and layout, wiring that meets the quality criteria Increased Safety "e" shall be used, or the wiring shall be of the fail-safe type.

When using more than one intrinsically safe circuit, the rules and regulations for interconnection shall duly be observed.

This EC type-examination certificate as well as any future supplements thereto shall at the same time be regarded as supplements to Certificate of Conformity PTB No. Ex-90.C.3145.

(18) Essential health and safety requirements

The tests and the favourable results these have produced reveal that the terminal box of types 8146/1...-.. and 8146/2...-.. meets the requirements of directive 94/9/EC as well as those of the standards quoted on the cover sheet.

Zertifizierungsstelle Explosionsschutz

Braunschweig, June 13, 2001

By order



Dr.-Ing. U. Klausmeyer
Regierungsdirektor



1st SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

(Translation)

Equipment: Terminal box, type 8146/1...-... and type 8146/2...-...

Marking: II 2 G EEx edm ia/ib [ia] IIC/IIB/IIA T6, T5 or T4

Manufacturer: R. STAHL Schaltgeräte GmbH

Address: Am Bahnhof 30
D-74638 Waldenburg (Württ.), Germany

Description of supplements and modifications

The terminal box, type 8146/1...-..., may also be fitted with bolt-type screw terminals connected with busbars.

Technical data

Rated voltage	up to	750 V
Rated current.....	max.	315 A for T6 400 A for T5
Rated short-circuit current.....	max.	70 kA
Rated cross section	max.	185 mm ² , connection with cable lug

Notes for manufacture and operation

The line-side fuse or protective device shall be selected so as to provide for safe interruption of the max. rated current, the max. rated short-circuit current, and the max. rated short-time current (1 s).

The supplement for the EC type-examination certificate shall at the same time be regarded as a supplement for Certificate of Conformity PTB No. Ex-94.C.3147.

Test report: PTB Ex 01-11145

Zertifizierungsstelle Explosionsschutz

Braunschweig, January 30, 2002

By order:

Dr.-Ing. U. Klausmeyer
Regierungsdirektor



Sheet 1/1

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

2nd SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

(Translation)

Equipment: Terminal box, types 8146/1...-.. and 8146/2...-..

Marking:  II 2 G EEx edm ia/ib [ia] IIC/IIB/IIA T6,T5,T4

Manufacturer: R. STAHL Schaltgeräte GmbH

Address: Am Bahnhof 30, 74638 Waldenburg (Württ.), Germany


Description of supplements and modifications

The terminal box, types 8146/1...-.. and 8146/2...-.., may also be employed in areas in which a potentially explosive atmosphere as a mixture of dust and air can occasionally form.

It has been re-inspected on the basis of Standards EN 60079-0, EN 60079-1, EN 60079-7, EN 60079-11, and EN 60079-18.

The marking will thus change to:

 II 2 G Ex dem ia/ib [ia] IIA, IIB, IIC T6, T5, T4

 II 2 D Ex tD A21 IP66 T 80 °C, T 95 °C, T 130 °C

The maximum temperature range changes to:

Type 8146/1 ...-.. -40 °C to +55 °C

Type 8146/2 ...-.. -40 °C to +75 °C

Technical data

Rated voltage:* up to 1100 V
Rated current:* max. 500 A
Conductor cross section:* max. 300 mm²

*) depending on type of terminal and Ex components used

Ambient temperature range:

Type 8146/1 ...-.. -40 °C to +55 °C

Type 8146/2 ...-.. -40 °C to +75 °C

The actual temperature range depends on the admissible temperature range of the components used and on the temperature class.

Protection against el. shock, foreign objects

and water:..... min. IP66 in accordance with EN 60529

Rated values are maximum values, the actual electrical values are determined by mounted electrical apparatus. Within these limiting values complying with the appropriate standards the manufacturer specifies the final limiting values dependent on power supply specifications, operating mode, utilization category, etc.

The composition of the protection symbol is based on the types of protection of the components actually used.

Applied standards

EN 60079-0:2006	EN 60079-1:2004	EN 60079-7:2003	EN 60079-11:2007
EN 60079-18:2004	EN 61241-0:2006	EN 61241-1:2004	

Test report: PTB Ex 07-17094

Zertifizierungsstelle Explosionsschutz

Braunschweig, October 17, 2007

By order:


Dr.-Ing. M. Theede
Oberregierungsrat



SUPPLEMENTARY SHEET 01

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1031

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²			
	1,5	2,5	4	
3				2)
6				
10	42			
16	14	28	108	4)
20	6	16	31	
25		7	17	
35			5	
50				3)
	14	14	14	
max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals				

Notes

- 1) Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- 2) additional conductors optional
- 3) to be specified by the manufacturer (including temperature rise test)
- 4) When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 02

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1041

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²						
	1,5	2,5	4	6	10	16	
3							2)
6							
10	44						
16	15	29	114				
20	6	17	33				
25		8	18	36			
35			5	14	35		4)
50				2	11	29	
63					3	13	
80						5	
100							3)
	28	28	28	10	10	8	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals						

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 03

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1241

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²								
	1,5	2,5	4	6	10	16	25	35	
3									2)
6									
10	45								
16	15	29	116						
20	6	17	33						
25		8	19	36					
35			5	14	35				
50				2	11	29			
63					3	13	48		
80						5	15	54	
100							6	14	
125								5	
150									3)
	56	56	33	20	10	8	6	5	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals								

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 04

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1242

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²								
	1,5	2,5	4	6	10	16	25	35	
3									2)
6									
10	55								
16	19	37	143						
20	8	21	41						
25		10	23	45					
35			7	17	44				
50				2	14	36			
63					4	17	60		
80						6	19	67	
100							8	17	4)
125								7	
160									3)
	56	56	33	20	10	8	6	5	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals								

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 05

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1051

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²						
	1,5	2,5	4	6	10	16	
3							2)
6							
10	50						
16	17	33	129				
20	7	19	37				
25		9	21	41			
35			6	16	39		4)
50				2	13	33	
63					4	15	
80						5	
100							3)
	46	46	46	17	17	13	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals						

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 06

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1052

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²						
	1,5	2,5	4	6	10	16	
3							2)
6							
10	61						
16	21	41	159				
20	8	24	46				
25		11	26	50			
35			7	19	49		4)
50				2	16	40	
63					5	18	
80						7	
100							3)
	46	46	46	17	17	13	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals						

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 07

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1061

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²								
	1,5	2,5	4	6	10	16	25	35	
3									2)
6									
10	53								
16	18	35	137						
20	7	20	39						
25		9	22	43					
35			6	17	42				
50				2	13	35			
63					4	16	57		
80						6	18	64	
100							7	17	4)
125								6	
160									3)
	92	92	66	34	24	19	11	9	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals								

Notes

- 1) Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- 2) additional conductors optional
- 3) to be specified by the manufacturer (including temperature rise test)
- 4) When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 08

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1062

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²								
	1,5	2,5	4	6	10	16	25	35	
3									2)
6									
10	64								
16	22	42	166						
20	9	25	48						
25		11	27	52					
35			8	20	51				
50				3	16	42			4)
63					5	19	69		
80						7	21	78	
100							9	20	
125								8	3)
160									
	92	92	66	34	24	19	11	9	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals								

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 09

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1071 and Type 8146/1S71

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²								
	1,5	2,5	4	6	10	16	25	35	
3									2)
6									
10	55								
16	19	36	142						
20	7	21	41						
25		10	23	45					
35			6	17	44				
50				2	14	36			
63					4	17	60		
80						6	18	67	
100							8	17	4)
125								7	
160									3)
	138	138	104	51	38	30	22	9	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals								

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 10

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1072 and Type 8146/1S72

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²										
	1,5	2,5	4	6	10	16	25	35	50	70	
3											2)
6											
10	66										
16	22	44	170								
20	9	25	49								
25		12	28	54							
35			8	21	52						
50				3	17	43					
63					5	20	71				
80						7	22	80			
100							9	21			
125								8	21		
160									7	19	
200										6	
225										2	
250											
	138	138	104	51	38	30	22	9	6	6	3)
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals										

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 11

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1073 and Type 8146/1S73

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²										
	1,5	2,5	4	6	10	16	25	35	50	70	
3											2)
6											
10	71										
16	24	47	184								
20	10	27	53								
25		13	30	58							
35			8	22	56						
50				3	18	47					
63					6	21	77				
80						8	24	86			
100							10	22			
125								9	23		
160									8	20	
200										7	
225										2	
250											3)
	138	138	104	51	38	30	22	9	6	6	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals										

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 12

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1075 and Type 8146/1S75

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²											
	1,5	2,5	4	6	10	16	25	35	50	70		
3												2)
6												
10	82											
16	28	54	212									
20	11	32	61									
25		15	35	67								
35			10	26	65							
50				3	21	54						
63					7	25	89					
80						9	28	99				
100							12	26				
125								10	26			
160									9	23		
200										8	4)	
225										3		
250											3)	
	138	138	104	51	38	30	22	9	6	6		
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals											

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 13

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1081

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²								
	1,5	2,5	4	6	10	16	25	35	
3									2)
6									
10	74								
16	25	49	192						
20	10	29	55						
25		13	31	61					
35			9	23	59				
50				3	19	49			
63					6	22	80		
80						8	25	90	
100							10	23	4)
125								9	
160									3)
	312	312	208	117	76	60	50	20	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals								

Notes

- 1) Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- 2) additional conductors optional
- 3) to be specified by the manufacturer (including temperature rise test)
- 4) When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 14

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1082

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²											
	1,5	2,5	4	6	10	16	25	35	50	70		
3												2)
6												
10	86											
16	29	57	221									
20	12	33	64									
25		15	36	70								
35			10	27	68							
50				4	22	56						
63					7	26	93					
80						10	29	104				
100							12	27				
125								11	28			
160									9	24		
200										8	4)	
225										3		
250											3)	
	312	312	208	117	76	60	50	20	14	14		
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals											

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 15

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1083

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²										
	1,5	2,5	4	6	10	16	25	35	50	70	
3											2)
6											
10	91										
16	31	60	235								
20	13	35	68								
25		16	38	74							
35			11	29	72						
50				4	23	60					
63					8	28	99				
80						10	31	111			
100							13	29			
125								11	29		
160									10	26	
200										9	
225										3	
250											
	312	312	208	117	76	60	50	20	14	14	3)
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals										

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 16

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1084

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²											
	1,5	2,5	4	6	10	16	25	35	50	70		
3												2)
6												
10	97											
16	33	64	251									
20	14	37	73									
25		18	41	79								
35			12	31	77							
50				4	25	64						
63					8	29	105					
80						11	33	118				
100							14	31				
125								12	31			
160									11	27		
200										10	4)	
225										3		
250											3)	
	312	312	208	117	76	60	50	20	14	14		
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals											

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 17

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1085

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²											
	1,5	2,5	4	6	10	16	25	35	50	70		
3												2)
6												
10	102											
16	35	68	265									
20	14	40	77									
25		19	43	84								
35			12	33	81							
50				4	26	67						
63					9	31	111					
80						12	35	124				
100							15	33			4)	
125								13	33			
160									11	29		
200										10		
225										4		
250											3)	
	312	312	208	117	76	60	50	20	14	14		
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals											

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 18

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1086

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²											
	1,5	2,5	4	6	10	16	25	35	50	70		
3												2)
6												
10	114											
16	39	76	294									
20	16	44	85									
25		21	48	93								
35			14	36	90							
50				5	29	75						
63					10	35	123					
80						13	38	138				
100							16	36				
125								14	37			
160									12	32		
200										11	4)	
225										4		
250											3)	
	312	312	208	117	76	60	50	20	14	14		
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals											

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 19

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1091

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current / A	cross section / mm ²								
	1,5	2,5	4	6	10	16	25	35	
3									2)
6									
10	86								
16	29	57	222						
20	12	33	64						
25		16	36	70					
35			10	27	68				
50				4	22	56			
63					7	26	93		
80						10	29	104	
100							12	27	
125								11	
160									3)
	676	676	468	273	190	128	106	60	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals								

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 20

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1092

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current A	cross section / mm ²																
	1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300	
3																	
6																	
10	97																
16	33	64	250														
20	13	37	72														
25		18	41	79													
35			12	31	77												
50				4	25	63											
63					8	29	105										
80						11	33	117									
100							14	31									
125								12	31								
160									10	27							
200										10	24	74					
225										3	13	29					
250											7	17	36				
315												3	10	22			
400														4	15	44	4)
500															2	8	
																	3)
	676	676	468	273	190	128	106	60	29	29	8	8	6	6	6	6	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals																

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 21

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1093

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current A	cross section / mm ²																
	1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300	
3																	
6																	
10	102																
16	35	68	263														
20	14	39	76														
25		18	43	83													
35			12	32	81												
50				4	26	67											
63					9	31	110										
80						12	34	123									
100							15	32									
125								13	33								
160									11	29							
200										10	25	78					
225										4	14	30					
250											7	18	38				
315												4	11	23			
400														5	16	46	4)
500															2	9	
																	3)
	676	676	468	273	190	128	106	60	29	29	8	8	6	6	6	6	
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals																

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

SUPPLEMENTARY SHEET 22

to EC TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

Fitting of terminal boxes Type 8146/1095

Max. number of conductors ¹⁾ depending on cross section and the permissible continuous current:

current A	cross section / mm ²																	
	1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300		
3																		2)
6																		
10	113																	
16	38	75	291															
20	16	44	84															
25		20	48	92														
35			14	36	89													
50				5	29	74												
63					10	34	122											
80						13	38	137										
100							16	36										
125								14	36									
160									12	32								
200										11	28	86						
225										4	16	33						
250											8	20	43					
315												4	12	25				
400														5	17	51	4)	
500															2	10		
																	3)	
	676	676	468	273	190	128	106	60	29	29	8	8	6	6	6	6		
	max. number of terminals depending of the above mentioned enclosure size and the cross section resp. max. permissible conductor cross section of the built-in terminals																	

Notes

- Each incoming conductor and each internal connection wire is counted as a conductor. Bridges and earthing conductors are not counted.
- additional conductors optional
- to be specified by the manufacturer (including temperature rise test)
- When applying the values of this table simultaneous factors or load factors to IEC 439 may be considered. Mixed equipment with circuits of different cross sections and currents is possible if the various values of the table are applied proportionally:

Example: (general)	cross section / mm ²	current / A	number of conductors	utilization
	2,5	16	10 (of 30)	= 33 %
	16	50	12 (of 48)	= 25 %
	25	63	36 (of 90)	= 40 %
			total	= 98 % < 100 %

3rd SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 1016

(Translation)

Equipment: Terminal box, types 8146/1***-** and 8146/2***-**

Marking:  II 2 G Ex d e m ia/ib [ia] IIA, IIB, IIC T6, T5, T4

 II 2 D Ex tD A21 IP66 T 80 °C, T 95 °C, T 130°C

Manufacturer: R. STAHL Schaltgeräte GmbH

Address: Am Bahnhof 30, 74638 Waldenburg (Württ.), Germany

Description of supplements and modifications

The 8146/1***-** and 8146/2***-** terminal box is modified in the following respects:

- 1) The ambient temperature is extended to a range of -60 °C to +100 °C.
- 2) The terminal box has been re-examined on the basis of standards EN 60079-0:2009, EN 60079-1:2007, EN 60079-7:2007, EN 60079-11:2007, EN 60079-18:2009 and EN 60079-31:2009. The marking therefore changes to:


 II 2 G Ex d e ia ib [ia Ga] mb IIA, IIB, IIC T6, T5, T4 Gb

or

 II 2 G Ex db eb ia ib [ia] mb IIA, IIB, IIC T6, T5, T4

 II 2 D Ex tb IIC T80 °C, T95 °C, T130 °C Db IP66

or

 II 2 D Ex tb IIC T80 °C, T95 °C, T130 °C IP66

Technical data

Rated voltage	max. 1100 V max. 750 V with bolt-type connection terminals
Rated current*	max. 500 A max. 315 A with bolt-type connection terminals and T6 max. 400 A with bolt-type connection terminals and T5
Conductor size*	max. 300 mm ² max. 185 mm ² with bolt-type connection terminals and connection with cable lug
*) subject to the type of terminal and 'Ex' components actually used	
Ambient temperatures	-60 °C to +100 °C
Protection against solid foreign objects, water and contact	IP 66 in accordance with EN 60529

Rated current, number of conductors and conductor size are defined in the corresponding supplements.

The composition of the protection symbol depends on the types of protection of the components actually used.

The actual ambient temperature range depends on the temperature range permitted for the components that are used from case to case.

Notes for manufacturing and operation

The maximum number of conductors for each enclosure size, which is subject to the cross section and the permissible continuous current, is shown in the supplements.

Equipment of Intrinsic Safety "i" type of protection shall be installed so that the clearances and creepage distances between intrinsically safe and non-intrinsically safe circuits, which are specified in EN 60079-14 are maintained.

When connecting more than one intrinsically safe circuit, the rules and regulations for interconnection must be observed.

The specified protection can be ensured only, if the information and instructions provided by the manufacturer are followed and the components are properly installed in the enclosure, the enclosure cover and/or the electrical equipment.

When installing the components in the electrical equipment, measures shall be taken to ensure that the temperatures at the place of installation remain within the range of working temperatures.

The selected line-side fusible or protective element must ensure that the max. rated current, the max. rated short-circuit current and the max. rated short-time current (1 s) are reliably disabled.

Terminal boxes that contain fuses have to be provided with an additional warning: "Do not open when energized".

Terminal boxes that contain intrinsically safe circuits in addition to non-intrinsically safe circuits, have to be provided with the warning: "Do not open when non-intrinsically safe circuits are energized". It is alternatively possible to cover the non-intrinsically safe circuits.

Applied standards

EN 60079-0:2009, EN 60079-1:2007, EN 60079-7:2007, EN 60079-11:2007,
EN 60079-18:2009, EN 60079-31:2009

Test report: PTB Ex 12-11123

Zertifizierungssektor Explosionsschutz

On behalf of PTB:

Braunschweig, March 12, 2012


Dr.-Ing. U. Klausmeyer
Direktor und Professor

