

()
INTERSTATE COUNCIL FOR STANDARDIZATION, METROLOGY AND CERTIFICATION
(ISC)

IEC 61000-3-12“ 2016

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3-12

16 ,

75 ,

(IEC 61000-3-12:2011,)



2017

IEC 61000-3.12—2016

1.0—2015 «
 1.2—2015 «
 1 «
 30 «
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 22 2016 . N9 93-)

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	BY KG RU	

4 2016 . 1926. 1 61000*3.12—2016 2
 1 2017 .
 5 IEC 61000-3-12:2011 «
 (). 3-12. > 16
 £75 » [«Electromagnetic compatibility (EMC) — Part 3-12: Limits — Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16A and £75 A per phase». IDT).

IEC 61000-3-12:2011 77 «
 » 77 IEC «
 IEC 61000-3-12:2011
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61000-3.12—2016

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(www.gost.fu)

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in

IEC 61000-3-12—2016

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4	5
4.1	5
4.2	6
4.3	7
5	7
5.1	7
5.2	7
6	11
7	12
7.1	12
7.2	12
7.3	13
7.4	14
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IEC 61000

- 1. (;) , :
- 2. ; ,
- 3. : (- *) ,
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- 4. ;
- 5. ;
- . ;
- 9. , , (. IEC 61000*6-1) ,

IEC 61000-3-12—2016

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3-12

, , 16 , 75

Electromagnetic compatibility (EMC). Part 3-12. Limits. Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and s 75 A per phase

— 2017—09—01

1

, , , 16 , () 75

• - : 240 8;

• - 50 60 . 690 :

• 230/400 8 50 . . 5. ,

1 —

^ — 75

IEC/TR 61000-3-14. IEC/TR 61000-3-6

IEC/TR 61000-3-6

IEC/TR 61000-3-6 /

^ —

IEC 61000-3.12—2016

5 —	16	IEC 61000-3-2.	16	-
6 —	()	.		-
a)				
b)				

2

IEC 60038, IEC standard voltages ()

IEC 60050-161:1990. International Electrotechnical Vocabulary (1EV) — Chapter 161: Electromagnetic compatibility

Amendment 1 (1997)

Amendment 2 (1998)

1 (1997)

2 (1998)

IEC 61000-2-2. Electromagnetic compatibility () — Part 2-2: Environment — Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems

(). 2-2.

IEC 61000-2-4. Electromagnetic compatibility (EMC) — Part 2-4: Environment — Compatibility levels in industrial plants for low-frequency conducted disturbances

(). 2-4.

IEC 61000-3-2. Electromagnetic compatibility (EMC) — Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

(). 3-2. ()

IEC 61000-4-7, Electromagnetic compatibility (EMC) —Part 4-7: Testing and measurement techniques — General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto

(). 4-7.

3

IEC 60050-161.

3.1

(total harmonic current.): 2 40

2

$$THC-JE'_{ft-2} = \sqrt{\sum_{h=14}^{40} h^2 |j_h|^2}$$

3.2 PWHC): PWHC (partial weighted harmonic current. (

(

$$PWHC = \sqrt{\sum_{h=14}^{40} h \cdot I_h^2}$$

3.3 (point of common coupling. PCCj):

3.4 (single phase equipment):

3.5 (interphase equipment):

3.6 (three-phase equipment):

1 —

2 —

3.7 (balanced three-phase equipment):

3.8 (unbalanced three-phase equipment):

3.9 (hybrid equipment):

3.10 S_{sc} (short-circuit power S_{sc}):

$U_{nominal}$

Z

$$S_{sc} = U_{nominal}^2 / Z.$$

Z —

IEC 61000-3.12—2016

3.11 equipment S_{cqu} : S_{eqi} (rated apparent power of the equipment) I_{cqu} (rated current of the equipment) U_p (rated voltage of the equipment) I_{gqa} (reference current) U_t (reference voltage) $I_{gqa\ max}$ (maximum reference current) U (nominal voltage) U_t (reference voltage) IEC 60038 (reference standard) 120 230 U_t 400 (reference voltage) I_{gqa} (reference current)

a) $S_{e<j_0} - U_p U_{qu} -$
 b) $S_{cqu} - U, I_{equ} -$
 c) $S_{equ} = U, I_{equ} -$
 d) $S_{gq(1)} - \sqrt{3} U_t I_{gqa\ max} -$

3.12 I (reference current) 4.1

3.13 I_{ogu} (rated current of the equipment) $I_{equ} Y$

3.14 R_{seq} (short-circuit ratio R_{scq})'

a) $R_{sce} - S_{sc} f Z S_{gqu} -$

b) $R_{sce} - S_{sc} (2 S_{equ} -$

c) $R_{scc} - S_{sc} S^{\wedge} -$

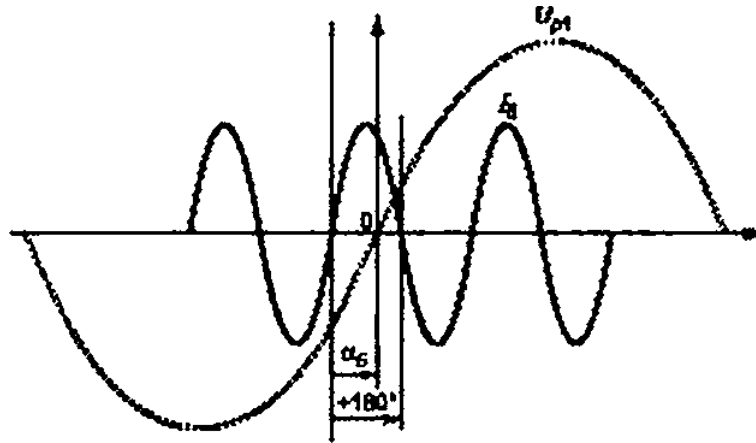
$1 - f_{t1} <$
 $I (Z I_{equ}) -$
 $> UH2 Z I_{tqu} -$
 R^{\wedge}

$U \cdot C /_{nf} T_{jir} f^{\wedge}$ $2 - R_{jce} e$ $I, 3 U_p$ R^{\wedge} IEC 61000-2-6. R^{\wedge} 5.2.

3.15 (stand-by mode): $($ $-$ $)$,

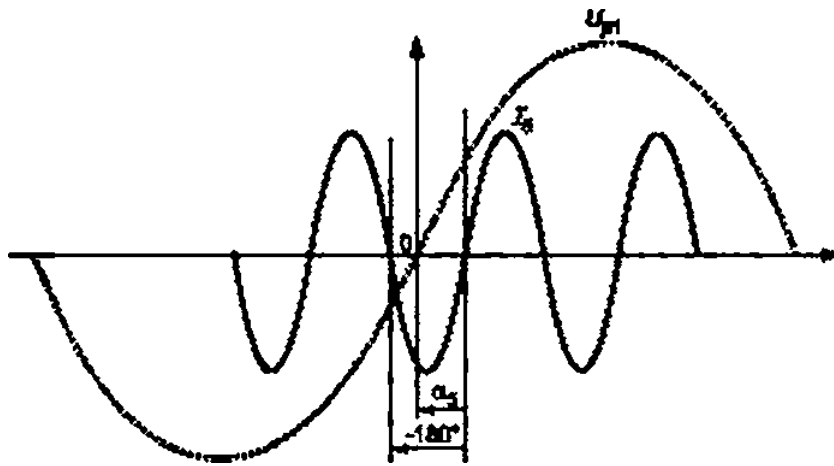
3.16 voltage U_{px} : 05. U_{px} (phase angle I_5 related to the fundamental phase) $5-$ \wedge $1 2.$

3.17 (professional equipment):



1—

U_{pi} 5- $J_{py} a_T > 0 >$ ^



2—

$U_{\%}(f_5)$ 5- ^
0)

4

4.1

7.4. (), 4.2.2

±10 %

IEC 61000-3.12—2016

90% 110 %

(. 4.2.5).

4.2

4.2.1

4.2.2

• (: (OFT), 1.5)

IEC 61000-4-7; DFT

4.2.7.

7.

4.2.3

iS % *

() () ; ; () .

(. 4.2.7) «

4.2.4

10

(. 3.15) 10%

4.2.5

(. 4.2.1). 2—5.

1.5 150 % 1 %

PWHC 4.2.2,

4.2.6

• I_{rof} 4.1; ,
 • R_{scc} :
 • $f_{i_{see}}$:
 • (. . .) .
 4.2.7
 1. T_{obs}

1 —

	1	4.2.3 -
£2.3)	T_{obs} ()	4.2.3" -
	T_{oes}	4.2.3 -
($7^{\wedge} > 2.5$))	(2.5 . -
• « » , , , 4.2.3.		

4.3 , (, ,) ,

5

5.1

(. 1 60050-161:1990.161-07-11).

(. IEC 60050-161:1990,161 -07-05).

a)

b)

2 ;

c)

5.2

230/400 . 50 .

IEC 61000-3.12—2016

! —

(; 230):

; 230 ;

; 400 ; 400

2—5.

$R_{sce} = 33$.

2 — $R_M \ll 33$.

33 3 —

33.

R_{scc} $R_{sce} - 33$.

33. 16 (.

6). 2 3 4 — 3

4

)

5- 7- 5 % 12-

b) S- [4—360°).

c) « — » (. 3.16) 5* 90 150 -

3- 4-

5

d) 5- 7- 3 % :

e) 5- [0 — 360°);

f) « — » (. 3.16) 5- 150 210*

3. 4 5 « -

a) 5 % ; 3- -

b) , , , , .

3. 4 16 .

2 ; 16 .

16 , IEC 61000-3-2 2.)

4.1 -

/? -

• R_{set} -

• IEC 61000-3-2 2—5; R_{sc} -

• 33; S_{sc} -

• R_{sc} (. 3.11 3.14); S_{sc} -

• S_{sc} -

6 2 — -

R_{tfe}	1 (*, %)						. %	
						1.3	^	pwhc «m»
33	21.6	10.7	7.2	3.8	3.1	2	23	23
66	24	13		5	4	3	26	26
120	27	15	10	6	5	4	30	30
250	3S	20	13	9	8	6	40	40
2 350	41	24	15	12	10	8	47	47

1 (— : / — .

16/m, %.

12- 12- -

PWHC.

R_{tee} .

IEC 61000-3.12—2016

3 —

	1 %				. %	
			'	'3	"!	PWHC _{κ,η}
33	10.7	7.2	3.1	2	13	22
66	14	9	5	3	16	25
120	19	12	7	4	22	28
2S0	31	20	12	7	37	36
350	40	25	1S	10	46	46

; / —

1 / . V

PWHC.

12-

12-

R_{foc}

^ -

(. .)

R_{itm}	%				. %	
					"	PWHC _{κt^}
33	10.7	7.2	3.1	2	13	22
2 120	40	25	15	10	48	46

4 ; —

; I_h —

1 / . V

PWHC.

12-

12-

R_M

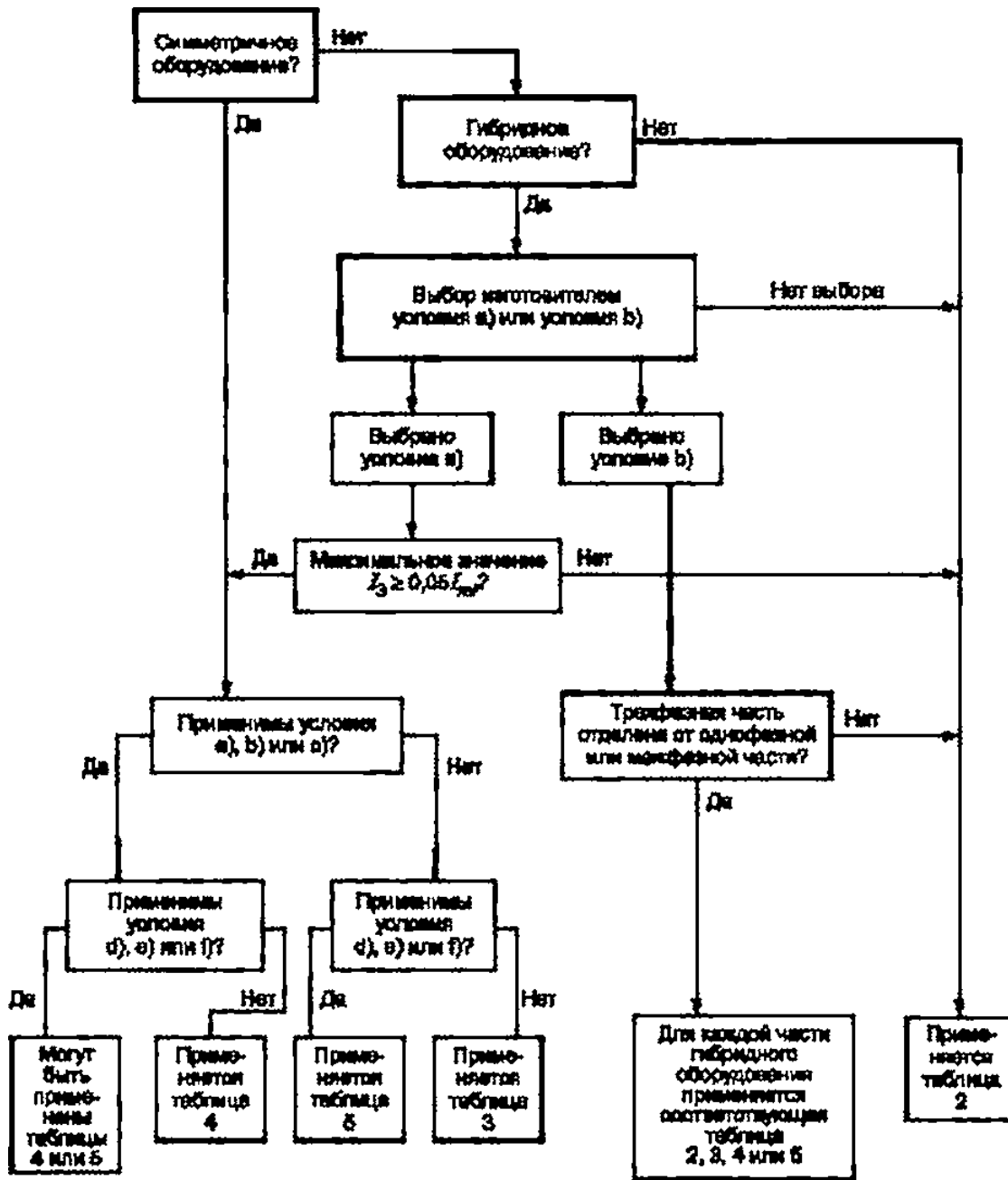
—

(d. .)

R_{4CV}													%	
		h	'	'13	'it	'19	'23	>2*	29	'	'	'	/	PWHC/
33	10.7	7.2	3.1	2	2	1.5	1.5	1.5	1	1	1	1	13	22
2 250	25	17.3	12.1	10.7	6.4	7.8	6.8	6.5	5.4	5.2	4.9	4.7	35	70
<p>$R_{Mt} \cdot 33$; I_h —</p> <p>1 / . %.</p> <p>1 % I_{nt}</p> <p>16 / , %.</p> <p>3 % I_{nt}</p> <p>12-</p> <p>12-</p> <p>140.</p> <p>4 #.</p>														

2—5.

3.



3—

6

R_{Жс} = 33.

):

«

IEC 61000-3-12—2016».

= 33.

IEC 61000-3.12—2016

• I_{sc} , 2.3.4 5; S_{sc}

- R_{Ste} (. 3.14);

- S_{sc}

IEC 61000-3-12—2016 «

S_{sc}

» XX — S_{sc}

R_{sco} 2.3.4 5.

7

7.1

a) (. 7.2);

b) (. 7.2).

7.2

R_{scc} ($R_{scc Min}$).

a) U 8

IEC 60038 (, 120 230 400 (—)

b) 10.5 % ± 2 %

c) 50 %

1 61000-2-2;

d) U

1.5% 5- ;

1.25 % 3- 7- ;

0.7 % 11- ;

0.6 % 9- 13- ;

0.4 % 2- 10- ;

0,3 % 12- 14- 40- ;

e) 2 3, R_{scc} I_{scmin} (, , ,)

).

4 5. $f_{sce\ min}$ (1,6

$R_{M\ min}$ 1.6 2 3.

0

$R_{sce\ min}$ (61000-4-7.

IEC 61000-4-7. 4.2

7.3

R_{sco} 7.2

a) 7.2

IEC 61000-2-4 3.

S_K

b)

13-

$\pm 2\%$
 $\pm 10\%$

{ £13).

IEC 61000-3.12—2016

—

40-

13-

1 %

16 75

(16 75);

)

$R_{sco\ min}$ (. 7.2),

2 3

R_{sce}

4 5.

5

5 min (. 7.2),

, 1.6

/?,

2—5.

$R_{scc\ mm}$

$R_{sce\ min}$

$R_{scc\ m}$

« R_{scc} » 6.

7.4

().

—

IEC 107.

()

.1

7.4.

20 %

.2

(V&D).

a)

90%

60 %

b)

70 %

(

2 *)

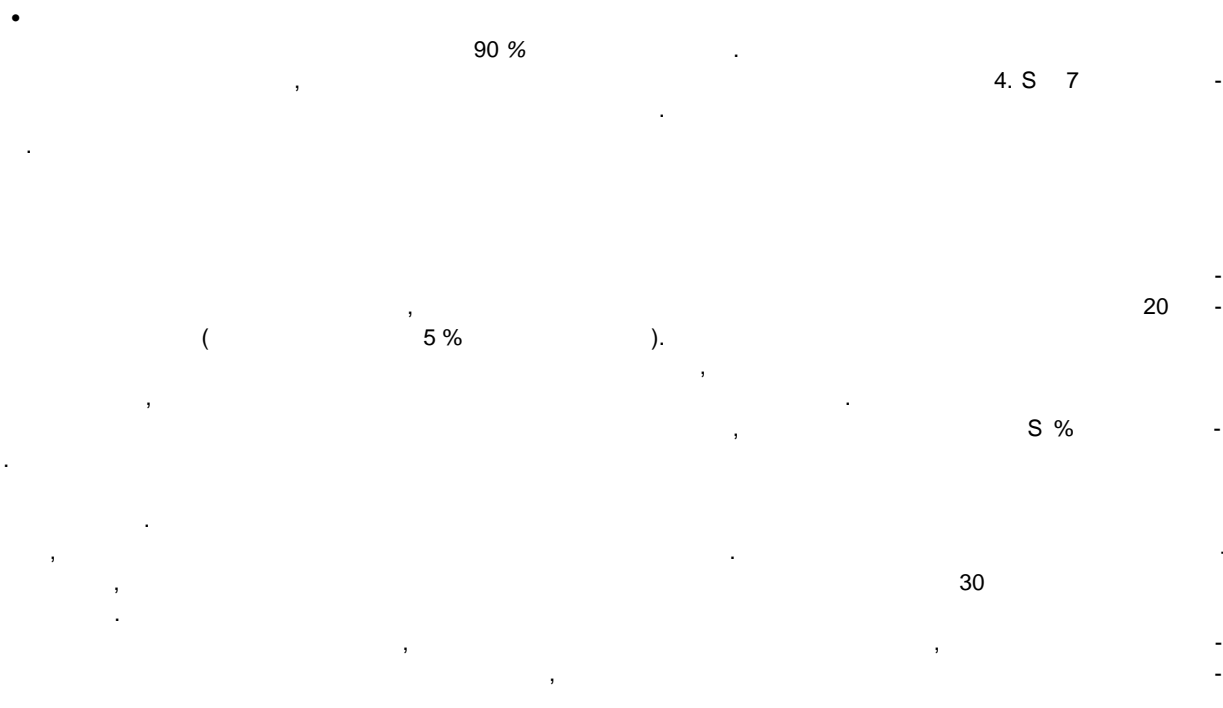
4.2.5

4.2.5.

70 %

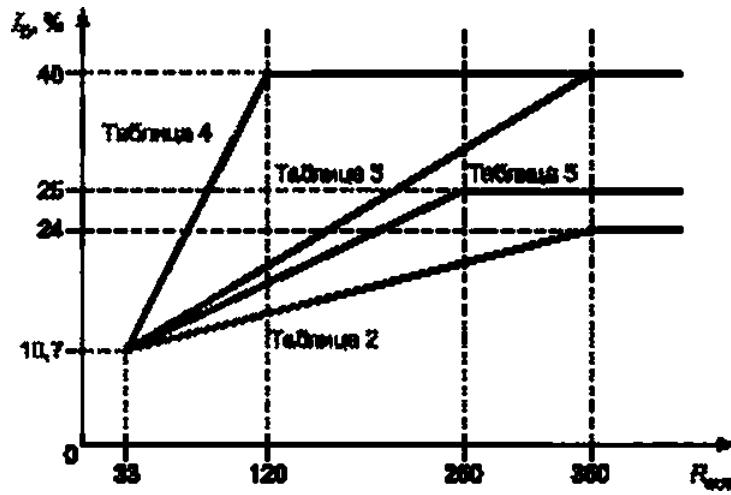
1 :

IEC 61000-3.12—2016



()

R_{SCC} от R_{SC} (, *33) S-ro 2.3.4 S. .1.



.1 —

5-

IEC 61000-3.12—2016

()

5.

()

.1

IEC 60038		29322—2014 (IEC 60038:2009) « *	
IEC 60050*161:1990 Amd. 1 (1997) Amd. 2 (1998)			
IEC 61000*2*2	—	••	
IEC 61000*2*4	IDT	IEC 61000-2-4—2014 « (). 2-4. »	- -
IEC 61000*3*2	IDT	IEC 61000-3-2—2016 « 3-2. ()» 16	- -
IEC 61000*4*7	MOD	30804.4.7—2013 (IEC 61000-4-7:2009) « »	- -
• (1998 .) ••	IEC 60050-161:1990	1 (1997 .)	- 2 -
• IDT — • MOD—			-

IEC 61000-3-12—2016

IEC/TR 61000-1-4	<p>Electromagnetic compatibility (EMC) — Part 1-4: General — Historical rationale for the limitation of power-frequency conducted harmonic current emissions from equipment, in the frequency range up to 2 kHz</p> <p>NOTE The derivation of limits defined in this standard is documented in IEC 61000-1-4. () . 1-4. . -</p> <p>[2]</p> <p>—</p> <p>IEC 61000-1-4</p>
IEC 61000-2-6	<p>Electromagnetic compatibility (EMC) — Part 2-6: Environment — Assessment of the emission levels in the power supply of industrial plants as regards low-frequency conducted disturbances</p> <p>[() . 2-6. . -</p> <p>]</p>
IEC/TS 61000-3-4	<p>Electromagnetic compatibility (EMC) — Part 3-4: Limits — Limitation of emission of harmonic currents in low-voltage power supply systems for equipment with rated current greater than 16 A</p> <p>(() . 3-4. . -</p> <p>16)</p>
IEC/TR 61000-3-6	<p>Electromagnetic compatibility (EMC) — Part 3-6: Limits — Assessment of emission limits for the connection of distorting installations to MV, HV and EHV power systems</p> <p>(() . 3-6. . -</p> <p>]</p>
IEC/TR 61000-3-14	<p>Electromagnetic compatibility (EMC) — Part 3-14: Limits — Assessment of emission limits for the connection of disturbing installations to LV power systems^{1*}</p> <p>[() . 3-14. . -</p> <p>]</p>
IEC Guide 107	<p>Electromagnetic compatibility — Guide to the drafting of electromagnetic compatibility publications</p> <p>{ no</p> <p>)</p>

621.396/.397.001.4:006.354

33.100.10

IDT

75 : ;
: ;
; ;

16 .
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07.12.2016. 17.01.2017. 30*34^
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