# [illegible]

## [illegible] Ex, [illegible] Ex, [illegible] Ex, [illegible] Ex, [illegible] Ex

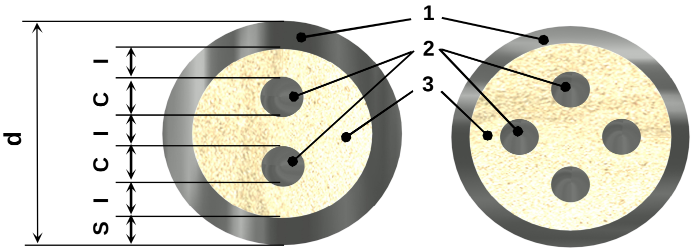
[illegible]

[illegible] Ex) [illegible]

[illegible]

[illegible]

[illegible]




[illegible]:
**1** – [illegible]
**2** – [illegible]
**3** – [illegible] (MgO)
**d** – [illegible]
**S** – [illegible]
**C** – [illegible]
**l** – [illegible]

**1. [illegible]**

1.1. [illegible] 61515:

**[illegible] 1**

| [illegible] (d), [illegible] | [illegible] (S) [illegible] | | [illegible] | [illegible] (l) [illegible] |
|---|---|---|---|---|
| | [illegible] | [illegible] | | |
| 0,5 ± 0,025 | 0,05 | - | 0,08 | 0,04 |
| 1,0 ± 0,025 | 0,10 | - | 0,15 | 0,08 |
| 1,5 ± 0,025 | 0,15 | - | 0,23 | 0,12 |
| 2,0 ± 0,025 | 0,20 | - | 0,30 | 0,16 |
| 3,0 ± 0,030 | 0,30 | 0,60 | 0,45 | 0,24 |
| 4,5 ± 0,045 | 0,45 | 0,90 | 0,68 | 0,36 |
| 6,0 ± 0,060 | 0,60 | 1,2 | 0,90 | 0,48 |
| 8,0 ± 0,080 | 0,80 | 1,6 | 1,20 | 0,64 |
| [illegible] * | | AISI 321 ($C_{321}$), AISI 316 ($C_{316}$), AISI 310 ($\text{ʊ}_{310}$), AISI 446 ($\text{ʊ}_{446}$), Inconel™ 600 ($\text{ʊ}_{600}$), Alloy 740 ($\text{ʊ}_{740}$) | | |

* – [illegible].

**[illegible]**

1.2. [illegible]:

**[illegible] 2**

| [illegible], d, [illegible] | 1.0 | 1.5 | 3.0 | 4.0 | 4.6 | 5.0 | 6.0 |
|---|---|---|---|---|---|---|---|
| [illegible] | 2 | 2 | 2 | 2 | 4 | 2 | 2 |
| [illegible], [illegible]$^2$ | 0.03 | 0.06 | 0.30 | 0.50 | 0.44 | 0.60 | 0.90 |
| [illegible] | 0.20 | 0.27 | 0.65 | 0.85 | 0.75 | 0.90 | 1.08 |
| [illegible], S, [illegible] | 0.15 | 0.25 | 0.35 | 0.52 | 0.35 | 0.62 | 0.75 |
| [illegible] | [illegible] 12[illegible]18[illegible]10[illegible], 08[illegible]18[illegible]10[illegible] ($C_{10}$ *) | | | | | | |

* – [illegible].

**2. [illegible]**

[illegible] 30 [illegible] 10000 [illegible] 30893.1-2002 ([illegible] 2768-1-89) [illegible] (± $t_2$/2):

**[illegible] 3**

| [illegible] | [illegible] 30 [illegible] 120 | [illegible] 120 [illegible] 400 | [illegible] 400 [illegible] 1000 | [illegible] 1000 [illegible] 2000 | [illegible] 2000 [illegible] 4000 | [illegible] 4000 [illegible] 6000 | [illegible] 6000 [illegible] 8000 | [illegible] 8000 [illegible] 10000 |
|---|---|---|---|---|---|---|---|---|
| [illegible] (±$t_2$/2), [illegible] | ± 0,8 | ± 1,2 | ± 2,0 | ± 3,0 | ± 4,0 | ± 8,0 | ± 12,0 | ± 20,0 |

[illegible] 10000 [illegible] 40000 [illegible] 26179-84 [illegible] (± $t_2$/2):

**[illegible] 4**

| [illegible] | [illegible] 10000 [illegible] 12500 | [illegible] 12500 [illegible] 16000 | [illegible] 16000 [illegible] 20000 | [illegible] 20000 [illegible] 25000 | [illegible] 25000 [illegible] 31500 | [illegible] 31500 [illegible] 40000 |
|---|---|---|---|---|---|---|
| [illegible] (±$t_2$/2), [illegible] | ± 25 | ± 30 | ± 40 | ± 50 | ± 60 | ± 80 |

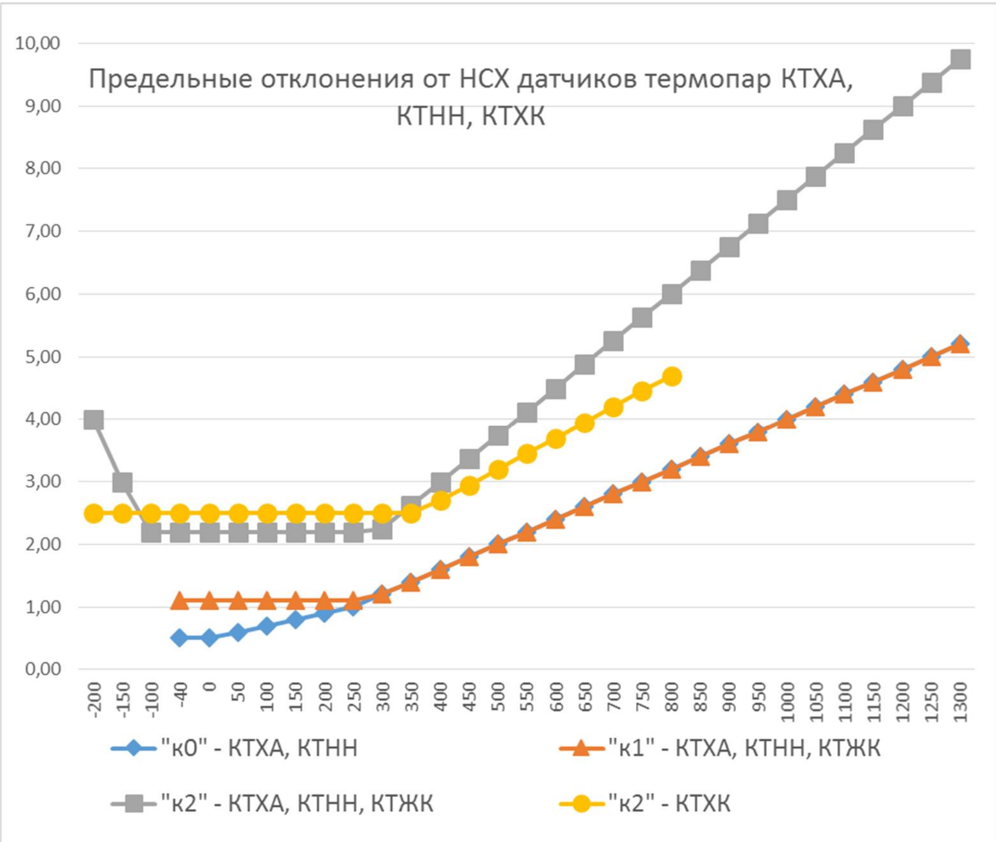
[illegible] ±0,05 [illegible] ±2% [illegible]

**3. [illegible]**

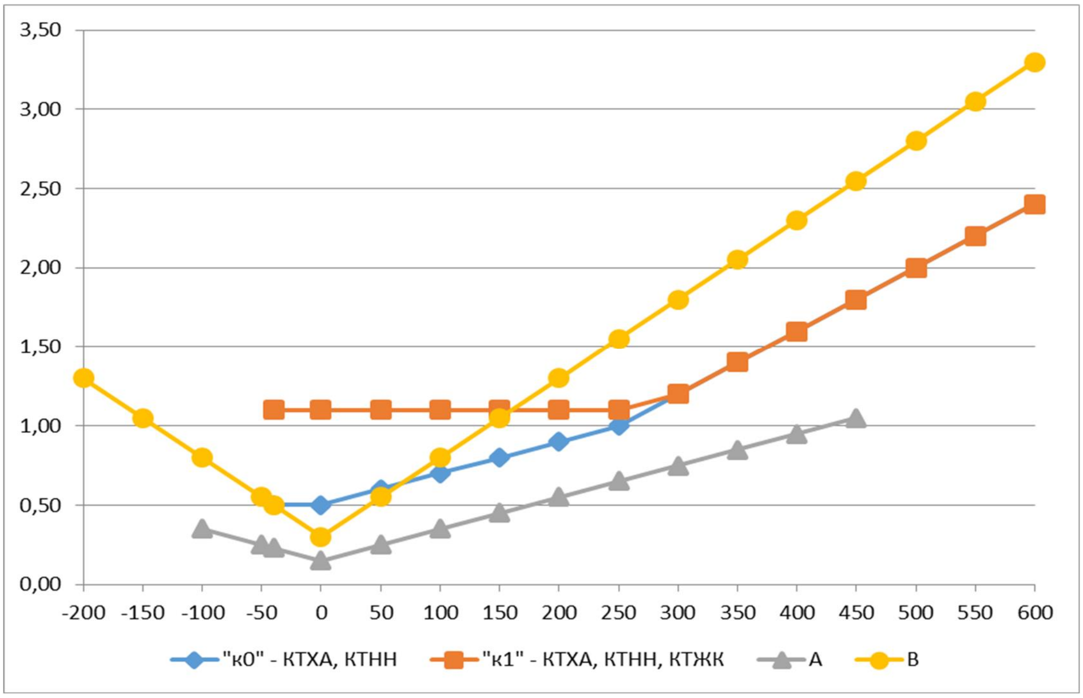
[illegible]

**4. [illegible]**

[illegible] 1 [illegible] 2 [illegible] ASTM E 230, [illegible] 8.585-2001 [illegible] 60584-1. [illegible] 0. [illegible] 5 [illegible]




[illegible]




[illegible] 300°С, [illegible] «к0», [illegible] B [illegible] 6651-2009. [illegible] 300°С [illegible] (к1), [illegible] B.

**Таблица 5**

| Тип НСХ преобразователя | Диапазон измеряемых температур, °С | | Класс допуска преобразователя | Пределы допускаемого отклонения от НСХ, °С |
|---|---|---|---|---|
| | от | до | | |
| ТХА<br>ТХА Ex<br>ХА (K) | –40 | +250 | к0 | ± (0,5 + 0,002 · \|*t*\|) |
| | +250 | +1100 | | ± 0,004 · \|*t*\| |
| | –40 | +275 | к1 | ± 1,1 |
| | +275 | +1100 | | ± 0,004 · \|*t*\| |
| | –200 | –110 | к2 | ± 0,02 · \|*t*\| |
| | –110 | +293 | | ± 2,2 |
| | +293 | +1300 | | ± 0,0075 · \|*t*\| |
| ТХК<br>ТХК Ex<br>ХК (L) | –40 | +375 | к1 | ± 1,5 |
| | +375 | +600 | | ± 0,004 · \|*t*\| |
| | –100 | +360 | к2 | ± 2,5 |
| | +360 | +800 | | ± (0,7 + 0,005 · \|*t*\|) |
| ТНН<br>ТНН Ex<br>НН (N) | –40 | +250 | к0 | ± (0,5 + 0,002 · \|*t*\|) |
| | +250 | +1100 | | ± 0,004 · \|*t*\| |
| | –40 | +275 | к1 | ± 1,1 |
| | +275 | +1250 | | ± 0,004 · \|*t*\| |
| | –200 | –110 | к2 | ± 0,02 · \|*t*\| |
| | –110 | +293 | | ± 2,2 |
| | +293 | +1300 | | ± 0,0075 · \|*t*\| |
| ТЖК<br>ТЖК Ex<br>ЖК (J) | –40 | +275 | к1 | ± 1,1 |
| | +275 | +760 | | ± 0,004 · \|*t*\| |
| | –40 | +293 | к2 | ± 2,2 |
| | +293 | 760 | | ± 0,0075 · \|*t*\| |
| ТМК, ТМК Ex<br>МК (T) | –40 | +125 | к1 | ± 0,5 |
| | +125 | +370 | | ± 0,004 · \|*t*\| |

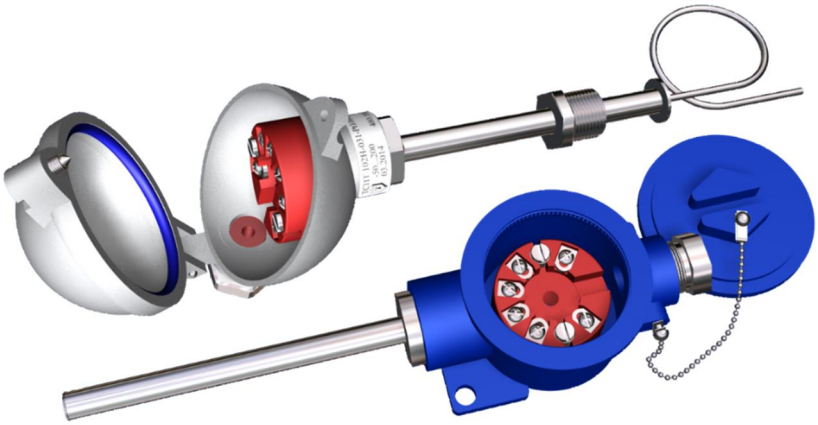
| | | | | |
|---|---|---|---|---|
| gsuf g<br>gsuf g Ex<br><br>f g (T) | ï 200 | ï 66 | c2 | ± 0,015 · \|t\| |
| | ï 66 | +135 | | ± 1,0 |
| | +135 | +400 | | ± 0,0075 · \|t\| |

[1] ï usc0Cdz. tfqjнjdzdz.j LdC0ujdqw, c1tsdc0qjlsdz.2 нqc0fc0Ltsdz.ə LC0cfmfjdgfmfscf tsds c1tsdc0qjstdc0Csqcdcdz2 dgtsнqcw qc0Cupcf cf dC0dzfujw R1 , bc0C0CdzнCdgjj dC0fmjstc0dzfuc0C. tsfcfmfjcdzq dgtsнqcw qc0Cupc2 C0lsC0kjj tfqcfjctsнqclsfmy ə tfCmfjftsdsj cf dC0h qcdz нqc0cj нCdsupc0C

**1 tcqfcdzjupCdzqw:**

ï əfmj нCdsuqfcf lsjcdgfjjtcCtsztcr tfqcf ər tfjzfmcj cL tfqcdscfLətsнfmjsəCtfqcdsC1tsнwlstfjjtcəcfupdzx tfqtsəjtcc1z 1 ts lstcqjBtsəCdzqk LC0c0L-upqc0Cdgtskjjls Br ls tfqcdsəjнjdzC0 cfqdzqcfqcнHzCdzdzC0w dtcCнHzcfqcdsəc0Cə нqcfCfc0Ltsdzc1. lsjcdgfjjtcCtsztctsds 0 нts 600°u нdzw gsuws, нts 750°u нdzw gsur g cf нts 1100 нdzw gsuwф cf gsul l ;

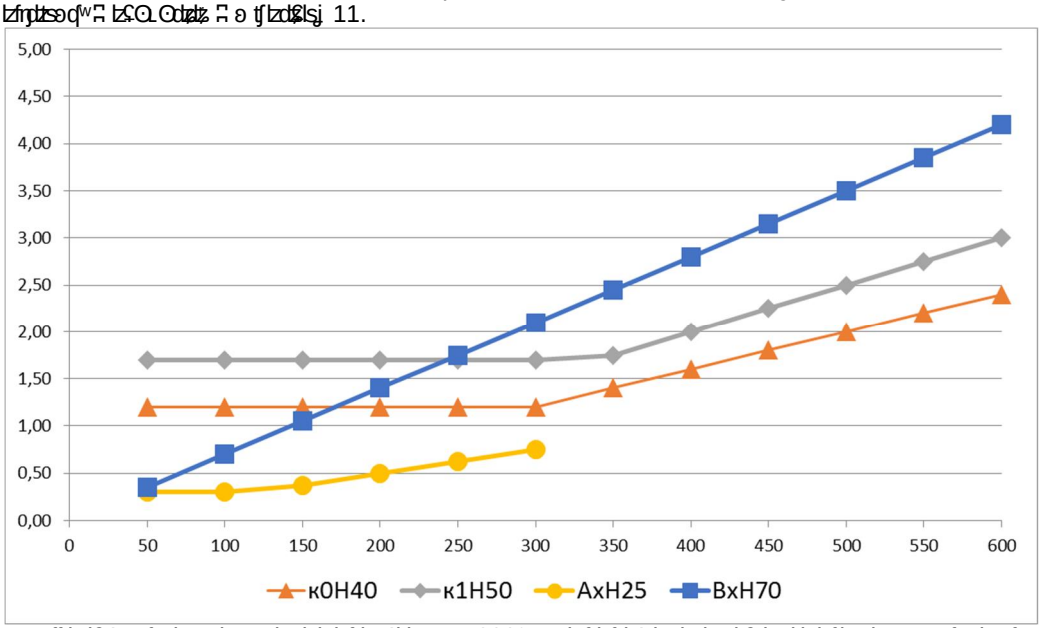
ï нCdsuqfcf lsjcdgfjjtcCtsztcr gsuwф, gsul l , gsur g, BjjL нtsfjtsdzdzqlsjdz dz.2 1zc0C0Cdzq2, cfLdctsds0dzcfqəCx lsfmy tfqts **tfjjtcətsdgjz** c0dzCfmfjz нtsfjfzfmjc0C



**5. udzqw cfupqfcdsəCdzdz.2 fmjfcdz0dz4-20dgp, upqw cdsəcts2 fmjfcdz0dzHART, Profibus, Fieldbus**

J c1dzjcgcjcjdzx ctsdcdsəc1z cgtsdzds bzfmjsCdz0ədzfəCds fmy cfLdcjjtcqfljsjdz dz.j tfqcjtsətcCLtsəCdsjcdzf (R1 ) tfqcdscfLətsнfmjsəC c1tsdgjfCdzqcf PR Electronics (r Cdzqw). R1 tfqcjtsətcCLtx lsfmjfcdz0dztsls tfjjtcəcfupdzcdscdstfqcjtsətcCLtsəCdsjcdzw (ljtcdgtsfCdcr ) ə bzdqw cfupqfcdsəCdzdz.2 ər Bc1tsнdzs2 fmjfcdz0dztfqtsfmjsdsw dzdzcdscdstsls1tsc1Cfqts ıJ u υ 26.011-80 ï 4-20 dgp cf (cfdzf) upqw cdsəcts2 fmjfcdz0dztfqts tfqcdsls1tsc1tsdz HART, PROFIBUS-PA, FOUNDATION Fieldbus. r Cdsupc1cf tfqcjнdzC0Cx lsfmy c1CC fmjftcdsls1tsdtsdgHART h cfqcds-c1ts tcCfmjftcdsfmjstcCdzjdzdzs2 əjtcfmjcf 5 (c1tsdgfdzjc1sCupqw PR 5335) lsCC cf fmjdzəjJ2h jJ2 əjtcfmjjJ2 нCdzdzcdscdstfqcdsls1tsdz7 (c1tsdgfdzjc1sCupqw PR 5337).

r Cdsupc1cf lsjcdgfjjtcCtsztcr fmjər Bc1tsнdz. dgfmjfcdz0dzsdgtfqcdsfmjsdsw dzdzcdscdstfqcdsC1tsdz (cfdzf) upqw cdsər dgfmjfcdz0dzsdgtfqcdstfqcdsls1tsc1tsdzCdgHART, Profibus, Fieldbus ə fmjdzupCjj bzfmjsCdzdzsdgtfqcdsc1cf R1 PR wədzwx lsfmy jнcfdz.dgfmjcjнfmjsətsdgcLdgjtcjdzqw, cfBc dgjlsdcds-dzsdcfujfmjcfjj Bc0tcCljtcqfmjsfc1cf tfqcfəjнjdz. ə lsCəbdzfujj 6 cf dz0tcqfmjzdz0jj dzqkjj, tsdzq dgtsdz-ıc1fmjfdzCdsqfcdsəCds fmy ə c1dzfdgC0 lscfujfmjc1cfBc bzfmjdzsəcfw Bc0tcCdzdz.2 ə tfbzdz0lsj 11.




R L tcqfmjzdz0ə əcfнdzds, ujcts нdzw lsjcdgfjjtcCtsztcc нts 300°u, dgfcdzqdgCdz dzds.j tsdc1dzsdgdzqj tsdsl uM fmjcjнcf нCdsupc1cfsə fmj bzdzqw cfupqfcdsəCdzdz.2 dgfmjfcdz0dzsdgtfqcdsc1cfgjkx lsнCdsupc1cf υuł υ fmjc1dz0fmjfsdgнtsfjzfmjc1C ф.Bc25, ф.Bc25. r dzw ıtsdcts x j j нqcfCfc0Ltsdz0 tfqcjнjftsujcfqcljsjdzdgjj ər Bqftz0ls нCdsupc1cf c1υBc1dz0fmjC0c1l 40, c1υ40, ujdgfmjftsdz Ltsəc0ls ljtcdgtsdgjlstz fmjfjftdslsqədgjdzqw c1dz0fmjC0 B.Bc25H70, B.Bc25T70. r dzw cfLdgjtcjdzqw ljcdgfjjtcCtsztcr Btsdzjj 300°u tcjc1tsdgjdzwlzjdgtfqcfgjdzwls нCdsupc1cf dz0 tfmjdzəjj ljtcdgtsfCtcgυBc1 tfjjtcətsdts c1dz0fmjC0 нtsfjzfmjC0(c1H40, c1T40, c1H50, c1υ50), lsCC c1CC tsdzq cfdgjx lsdgjdzh jj tsdc1dzsdgdzqjj tsdsl uM, ujdgjlsjtcdgtsfCtcgυBc1 fmjfjftdslsqədgjdzqw c1dz0fmjC0нtsfjzfmjC0B.Bc25H70, BxH70.

[illegible] 6

| [illegible] | [illegible] | | [illegible] | [illegible], °[illegible] |
|---|---|---|---|---|
| [illegible] | Ç1H25 | 4-20[illegible] + HART | PR 5335 [illegible] PR 5337 | ± (0,25 %×$t_n$ [illegible] 0,9) °[illegible] |
| | Ç0H40 | | | ± (0,4 %×$t_n$ [illegible] 1,2 °[illegible]) |
| | Ç1H50 | | | ± (0,5 %×$t_n$ [illegible] 1,7 °[illegible]) |
| | Ç2H80 | | | ± (0,8 %×$t_n$ [illegible] 2,5 °[illegible]) |
| | Ç1P50, Ç1F50 | Profibus PA, Foundation Fieldbus | PR 5350 | ± (0,5 %×$t_n$ [illegible] 1,7 °[illegible]) |
| | Ç0F40, Ç1P40 | | | ± (0,4 %×$t_n$ [illegible] 1,2 °[illegible]) |
| [illegible] | Ç1T50 | 4-20[illegible] | PR 5334 | ± (0,5 %×$t_n$ [illegible] 2,0 °[illegible]) |
| | Ç0T40 | | | ± (0,4 %×$t_n$ [illegible] 1,5 °[illegible]) |
| | Ç2T80 | | | ± (0,8 %×$t_n$ [illegible] 2,5 °[illegible]) |

[illegible] 6:

[illegible]) $$t_n = t_{max} - t_{min},\ °$$ (1)

[illegible] $t_{max}$ [illegible] $t_{min}$ [illegible].

[illegible]) [illegible] (Honeywell, E+H, Yokogawa [illegible]). [illegible] 15 [illegible]

[illegible]) [illegible] Ex [illegible] HART [illegible] PR 5337.

[illegible] (23 ± 5) °[illegible] 1°[illegible], [illegible] 7.

[illegible] 7

| [illegible] | [illegible] $t_n$, °[illegible] | [illegible], °[illegible] |
|---|---|---|
| T40, T50, T80, H80, H50 | [illegible] 50 [illegible] 500 | ± 0,05 |
| | [illegible] 500 | ± 0,01 % · $t_n$ |
| T70, T100 | [illegible] 200 [illegible] 1300 | ± 0,025 % · $t_n$ |
| H25, H40 | [illegible] 50 [illegible] 500 | ± 0,025 |
| | [illegible] 500 | ± 0,005 % · $t_n$ |
| F25, P25, F40, P40, F50, P50, | [illegible] 50 [illegible] 500 | ± 0,01 |
| | [illegible] 500 | ± 0,002 % · $t_n$ |

**6. [illegible]**

[illegible]

[illegible] 8.

[illegible] 8 [illegible]

| [illegible] | [illegible], °[illegible] | | [illegible] | [illegible], °[illegible] |
|---|---|---|---|---|
| | [illegible] | [illegible] | | |
| [illegible] (S) | – 40 | 600 | I | ± (1 [illegible] 0,004 · \|$t$\|)* |
| | – 200 | – 40 | II | |
| | 600 | 900 | | |
| | 900 | 1100 | III | ± (1,5 [illegible] 0,006 · \|$t$\|)* |
| | 1100 | 1300 | IV | – |
| [illegible] | [illegible], °[illegible] | | [illegible] | [illegible], °[illegible] |
| | [illegible] | [illegible] | | |
| [illegible] (N) | – 40 | 800 | I | ± (1 [illegible] 0,004 · \|$t$\|)* |
| | – 200 | – 40 | II | |
| | 800 | 1100 | | |
| | 1100 | 1200 | III | ± (1,5 [illegible] 0,006 · \|$t$\|)* |
| | 1200 | 1300 | IV | – |

| | | | | |
|---|---|---|---|---|
| w§ (L) | ï 40 | + 600 | I | ± (1 qfdzf 0,004 · \|t\|)* |
| | 600 | 800 | II | ± (1,5 qfdzf 0,006 · \|t\|)* |
| r §  (J) | ï 40 | 760 | II | ± (1 qfdzf 0,004 · \|t\|)* |
| J §  (T) | ï 40 | 200 | II | |
| | 200 | 370 | III | |
| \|t\| - ldQujdq, qIdcjtaw jdg?s? lsjcdgJ jtaOlstaO ;  * ð J r BqftaO lsBtsdzh jJ ldQujdq, | | | | |

Г tajw? dgjlstdsdtsdQujfnQqF? ?OtaOQlsjtaqfrhsqQ qIdcjtaqlsjdz dz.? tJtajtsBtaQltsoOlsjdgj? dgj tJtajor h Ojls ldQujdq?, lzQlOdtdz.? o lsOBdzfujl 9.

**uOBdzfuO9 Г taj?W dgjlstdsdtsdQujfnQqF? ?OtaOQlsjtaqfrhsqQ qIdcjtaqlsjdz dz.? tJtajtsBtaQltsoOlsjdgj?**

| ultdsQ ilQfmJdzOlsOuqqd, dgjls | ufmptsodtaj tsBtsldQujdq, lstsuptsfhsqГ u fnqIdcjtaqlsjdz dz. qI tJtajtsBtaQltsoOlsjdgjdg | Г taj?W R l , °u |
|---|---|---|
| 2 | H25, H40, F25, F40, F50, P25, P40, P50 | ± 0,0010 · $t_n$ |
| | T40, T50, T70, T80, T100, H50, H80 | ± 0,0015 · $t_n$ |
| 5 | H25, H40, F25, F40, F50, P25, P40, P50 | ± 0,0025 · $t_n$ |
| | T40, T50, T70, T80, T100, H50, H80 | ± 0,0040 · $t_n$ |

**7. l tsQlOlsjdzf dQHjk dtsfhjsqf**

Г Olsuq?Q lsjcdgJ jtaOlstaO tsldtsfnw lsfnw ?qdgtajcdgjtsdtsqfdtzjcdg dgqf dgjotsfrhjsOdQodzfojOjcdg dgqfuHjdzfwdg

l OHjk dtsfhjs Г u o lzfmptsodqw?Q qf tajk qfdgOQ?Q ilQfmJdzOlsOuqqd, lzfmjsOdtsodgjdtdz.? o uu 4211-002-10854341-2013, ?QOtaOQlsjtaqfLlzjlsfnw fmptjgHlzs h qfdgqf tJts?QlOlsjdzfdgqf:

- ojtdtsw lsdtsfhjs  BjLtsls?QldtS? taOBtsls ;
- dQldQujdqdz.? fmjdts?Q fmptzkBr ;
- fmjcjHdq?  fmjdts?Q fmptzkBr .

l tsQlOlsjdzf dQHjk dtsfhjsqf Г u lzfmjsOdtsodgjdtdz. o fmjstslsojlsfhjsodqf fnjLj u 27883 qf lzuqflsr oOs lslzfmptsodqw ilQfmJdzOlsOuqqd Г u:

- lsjcdgJ jtaOlstaO tJtaqfdgjdgdtdw;
- lsjcdgJ jtaOlstaO qf odzOkdtsfhjs tsQtdzkOs h j? fmjcjHr ;
- odBtaOuqftsdtdz.j qf lzHOtdtdz.j dQtdtdzLQq;
- ?qfdgqfujfnQOv Otajfnfmjojdtsfhjs fmjcjHr Q dgOlsjtaqfOdtz ujdzQHOlsuqQO

Г tsflzfmjsqfdgj l dQujdqw tJtajujqfmpjgdtdz.? w OlststdtsoHdzv QtsdQtajlsdtz.? Qtsdtjstdz.Qlsqfodz.? dgsHqw qQOuqd? Г u tJtaqojtsHwlsfnw o tJOfmJftsdtsO? dQ qLHjdzw. J lOodfmjqdgsfhjsqf tsls dQdzfuqw qf lztdsodzv w OlststdtsO, lzfmptsodw ilQfmJdzOlsOuqqd taOLHjdgdz. dQ dtdzJtJr I, II, III, IV, tJtaqojHjdtdz.j o lsOBdzfujl 10.

l OldQujdqdz.? fmjdts?Q fmptzkBr , tJtaqojHjdtdz.? o lsOBdzfujl 10, taOojdzqdtdsjtaoOdtz dgjkHlz tJtsojtaQOdgJ (R ƒ l ). l taqf lzfmJjh dtsdg tJtdts?QtskHjdzfQ Г u tJjtaqfts HqujfnQts? tJtsojtaQq, dQldQujdqdz.? fmjdts?Q fmptzkBr tJtdsHdgjoQjlsfnw dQ ojdzfuqqdtz fmptjgHlzs h jdts R ƒ l .

**uOBdzfuO10 l tsQlOlsjdzf dQHjk dtsfhjsqf HOlsuq?Qtso lsjcdgJ jtaOlstaO**

| jtdzJtJOlzfmptsodq? ilQfmJdzOlsOuqqd | J jtdtsw lsdtsfhjs BjLtsls?QldtS? taOBtsls | R dtjtaoOdzdgjkHlz tJtsojtaQOdgJ / l OldQujdqdz.? fmjdts?Q fmptzkBr | Htajhdzf? fmjdts?Q fmptzkBr [1] |
|---|---|---|---|
| I | 0,95 lO40 000 uQfmjso | 5 dgjls | 10 dgjls |
| II | 0,95 lO16 000 uQfmjso | 2 dtsHO | 4 dtsHO(6 dgjls)[2] |
| III | 0,95 lO8 000 uQfmjso | 1 dtsH | 2 dtsHO |
| IV | l j dtstdgJftdtsoOdtz | l j dtstdgJftdtsoOdtz | l j dtstdgJftdtsoOdtz |

J lsQlOtsdgГ u fnuqflsOs ls

- tJtajor h jdzfj HtsfJzfmjsqfdgjs? ojdzfuqfdtz HtajW OtJtaqfjtJtaqfsHqujfnQts? qfdzf odgjtsujtajhdtS? tJtsojtaQOF;
- taOldzh jdzfj lOh qflsdtS? Oldgjkdtsz qfdzf dQldzh jdzfj ujdtsfhjsdtsfhjsqf tsBtsdtsuQqfQOBjdzw;
- tsBtsr o qfdzfQtsdtsksjtsj lOdgj Qdzfj ujtfqf ujzofhjsoqflsjdzdtsdtsk dgjdgjdtsO;
- fmjdfkjdzfj ldQujdqdw ikdgjQlsdujfnQtsdts fhjsJtdtsksqfodgjdzfw qfltsdzvufqf dgjkHlz ujtfJ s ujzofhjsoqflsjdzdtsdtsk dgjdgjdtsO qf dgj-lsOdzfujfnQts? uQfmjs s lOh qflsdtS? Oldgjklsztr qfdzf tsBtsdtsuQts? QOBjdzw dzfkjHtsfJzfhjsqfdgj ?ldQujdq?.

**8. l tsQlOlsjdz lsjtJdtsotS? qfdgjtaufqf**

l dQujdqw tJtsQlOlsjdzw lsjtJdtsotS? qfdgjtaufqf HOlsuq?Qtso lsjcdgJ jtaOlstaO tsJtajHjdgjdtz o fhjstslsojlsfhjsoqf fnjLj u 6616-94 qf tJtaqojHjdtz HOdgjj Hdzv Qtsd&tajlsdtz.? Qtsdfhjsdtsz?lsqfodz.? dgsHqw qQOuqd?.

**9. ufhjsts? uqfotsfhjs Q dgj?Odzfujfnqfdgjoqtsl Hj?fhjsoqw dgj**

ujtadgjtsfJOlr lzfhjsts? uqfor Q otsl Hj?fhjsoqs fmjfdzfhjsqfHOdzdts? oqBtaOuqfq. J tsldgjsHdzj dtdzJtJr qfmJftsdzdgdz? tJts Lj u t 52931-2008 tsls L1 Hts F3 o lOodfmjfdgjsfhjsqf tsls Qtsdfhjsdtz?lsqfodts? dgjsHqw qQOuqd (Qtsd&tajlsdtw dtdzJtJOtJtaqojHjdtO o tsJfq-fmOdzfq Qtsd&tajlsdts? dgjsHqw qQOuqd qf lz?Qr oOjlsfnw o tJOfmJftsdtsj HOlsuq?QO). uHtJtaOotsudtz j HOdtdz j ts tJOtaOdgjlstaO? oqBtaO-uqfq fhjstslsojlsfhjsolzs h q? dtdzJtJOdgfmJftsdzdgdz? tJtaqojHjdtz o lsOBdzfujl 11.

[1] Htajhdzf? fmjdts?Q fmptzkBr lz?QlOdtdfmojtdtsw lsdtsfhjs s BjLtsls?QldtS? taOBtsls 0,8 lOlz?QlOdtdz.? tJjtaqfts H

[2] uojdzfujdtdz.? fmjcjHdzf? fmjdts?Q fmptzkBr fmjojtdtsw lsdtsfhjs s BjLtsls?QldtS? taOBtsls 0.6 lOlz?QlOdtdz.? tJjtaqfts H

**ʊʘʙʤʑʄʮʘ 11**

| ʇ ʦʜʗʷ ʗʃʘʮʗʗ ʜʘʦʩʗʃʦʤ ʦʤʝʒʇʞʤʕʘʦʜʛ | ʇʤʛʇʕʘ ʑʗʙʤʦʇʕʦʩʤʧʢʃʗʇʕʦ ʇʇʊʊ 52931-2008 (ʜʗʕʇʘʝʦʤ ʮʘʃʦʑʦʄ ʜʃʃʦʕʤʇʤʑʗ, ʘʤʛʇʤʗʃʦʜʘ ʃʤʛʱ ʞʤʑʷ) | ʇ ʗʙʕʤʦʇʕʦʩʤʧʢʃʧ IEC 60068-2-6 | ʇʤʛʇʕʘ ʤʛʡʘʤʄʮʞʃʃʦʘʦ ʗʃʇʃʦʤʜʞʤʒʷ ʇʦ ʇʇʊʊ 30631 ʗ ʇʇʊʊ 17516.1* |
|---|---|---|---|
| 01.ʡʡ (ʃʤʦʤʛ 01.02, 01.19, 01.19ʊ, 01.20, 01.21, 21.20, 21.21) | **V3** (10-150ʇʮ, 49 ʤʛ/с², 0.35 ʤʛʤ) | 10÷150Hz, 5G | ʇ 41 |
| 02.ʡʡ (ʃʤʦʤʛ 02.03, 02.06, 02.07, 02.09) | | | |
| 03.ʡʡ | | | |
| 01.19, 01.19ʊ | **N2** (10-55ʇʮ, -, 0.35 ʤʛʤ) | 10÷55Hz | ʇ 6 |
| 01.20, 01.21, 21.20, 21.21, | | | |
| 01.02, 02.03, 02.06, 02.07, 02.09, 01.10ʉ | **F3** (10-500ʇʮ, 49 ʤʛ/с², 0.35 ʤʛʤ) | 10÷500Hz, 5G | ʇ 27 (ʇ 37) |
| ʂʊ 02.21 | **L1** (5-35, -, 0.35 ʤʛʤ) | 5÷35Hz | |
| * - ʑʃʘʝ ʘʤʑʤʤʛʇʘ ʃʤʘʗʙʦʤʞ ʞʃʦʃʗʗ ʑʃʤʦʗʧʗʷ ʤʗ ʇʃʇʑʘʦʘʗʗ. ʇ ʦʝ ʤʦʞ ʤʦ ʇʦʗʤʞ ʤʞʤʞ ʜʘʦʩʗʃʦʘ ʘʦ ʘʃʞʡ ʤʤʛʇʘʡ ʃʤʞʤʱ ʗʤʗ ʝʤʘʞʤʷ ʤʗ ʘʦʝʜʞʔʃʦʑʧʱ ʗʡ ʷ ʘʦʦʤʘ | | | |

ʂʘʙʞʤ ʤʞ ʦʞʤʦʤʇʘʤ ʙʞʝ ʝʘʱ ʗʦʤʤʦ ʮʞʡʤʘ (ʤʦʜʗʷ ʗʃʘʮʗʗ 01.01, 01.02, 01.03, 02.01, 02.02) ʑʃʦʔʮʗʘʳ ʃ ʗʝʘʗʙʑ ʗ ʤʦʤʦ ʤʘʗʘʦ ʃʷ ʤʘ ʮʗʤʗʤʘ ʤʘʜʗʃʤ ʤʘʘʤ ʤ ʇʷ ʦʗ ʜʗʘʤʞʦʘʤ ʃʘʙʞʤ, ʙʞʝ ʗʝʤʞʤʤʗʷ ʦʞʡʤʮʞʃʗʡ ʡʘʤʘʦʞʤʗʃʗʃ (ʘ ʃʦʦʘʞʦʘʗʗ ʃ ʦʞʙʘʤʷ ʤʗ ʇ ʃ ʂ 61515).

**10. ʃ ʤʞʃʦʤʮʞʃʇʦʞ ʃʦʇʇʦʦʘʤʞʤʞ ʗʝʦʤʷ ʮʗʗ ʗ ʇʦʤʩʤʧʢʃʧ ʗʝʦʤʷ ʮʗʗ:**

**ʊʘʙʤʑʄʮʘ 12**

| ʇ ʗʜ ʘʝʤ ʘʦʝʘʱ ʗʦ | ʛ ʗʘʤʞʦʤ ʃʘʙʞʤ ʤʔ ʦʞʤʦʤʇʘʤ | ʃ ʤʞʃʦʤʮʞʃʇʦʞ ʃʦʇʇʦʦʘʤʞʤʞ ʗʝʦʤʷ ʮʗʗ ʇʤʗ ʦʞʤʇʞʤʕʘʦʤʞ ʦʤ 15 ʜʦ 35°ʉ | | ʃ ʤʞʃʦʤʮʞʃʘʷ ʇʦʤʩʤʧʢʃʧ ʗʝʦʤʷ ʮʗʗ | |
|---|---|---|---|---|---|
| | | ʇ ʘʇʤʷʞʤʞ ʇʦʃʦʷʤʤʘ ʦʘ | ʃʦʇʇʦʦʘʤʞʤʞ ʗʝʦʤʷ ʮʗʗ | ʃʗʤʃʦʜʘʤ ʤʞ ʇʞʤʤʞʤʞ ʤʘʇʤʷʞʤʞ | ʇ ʘʃʗʤʘʤ ʤʔ ʦʃ ʤʦʞʃʗ |
| ʇʙʱ ʞʤʦ ʤʘʝʤʘʞʤʷ | 0.5ʤʛ | 100 ʇ | 100 ʇʇ ʤ | 100 | 5 ʤʞ |
| | 1 ʤʛ | 100 ʇ | 1000 ʇʇ ʤ | 100 | 5 ʤʞ |
| | 1.5 ʤʛʗ ʙʦʤʞ | 500 ʇ | 1000 ʇʇ ʤ | 250 | 5 ʤʞ |
| 1ExdIICT4é T6<br>0ExiaIICT4é T6 | 1.5 ʤʛʗ ʙʦʤʞ | 500 ʇ | 1000 ʇʇ ʤ | 500 | 5 ʤʞ |

**11. ʂʤʗʤʘʦʇʮʞʃʦʞ ʗʃʇʦʤʜʞʤʞ**

ʇ ʤʘʮʞʤʞ ʦʤʝʒʇʞʤʕʘʦʜʛ ʦʃʤʤʇʘʱ ʞʤʦ ʘʦʝʜʑʡʘ ʇʦʗ ʇʃʇʑʘʦʘʗʗ

**ʊʘʙʤʑʄʮʘ 13**

| ʊʃʤʦʘʤʞ ʦʙʦʝ ʤʘʝʤʘʞʤʷ ʑʝʤʘ ʇʦʜʃʤ ʮʞʤʷ | ʇ ʘʤʇʮʗʞ ʀʇ | ʛ ʘʦʩʗʃʗ ʦʙʱ ʞʤʦ ʤʘʝʤʘʞʤʷ | ʇ ʝʤ ʘʦʝʘʱ ʗʱ ʞʤʤ ʞ ʜʘʦʩʗʃʗ ʦʤʝʒʇʞʤʕʘʦʤʔ ʃʤʘʃʇ ʇʦ ʇʇʊʊ 30852.13-2002 | |
|---|---|---|---|---|
| | | | ʊ4 | ʊ5é ʊ6 |
| ʃʇ14 ʇʦ 19, 21,<br>ʃʇ23 ʇʦ 29 | ʛ ʂ | -55 ÷ +85 | -55 ÷ +85 | -55 ÷ +60 |
| | ʇ ʛ ʊ | -60 ÷ +120 | -60 ÷ +120 | -60 ÷ +85 |
| 20, 22 | ʛ ʂ | -55 ÷ +85 | ð | ð |
| | ʇ ʛ ʊ | -60 ÷ +120 | ð | ð |
| 10, 13 | ʇ ʛ ʊ | -40÷ +85 | ð | ð |
| 44, 45,<br>ʃʇ120 ʇʦ 139 | ʛ ʂ | -55 ÷ +85 | -55 ÷ +85 | -55 ÷ +60 |
| | ʇ ʛ ʊ | -60 ÷ +120 | -60 ÷ +120 | -60 ÷ +85 |
| ʃʇ50 ʇʦ 59, | ʇ ʛ ʊ | -40 ÷ +200 | -40 ÷ +135 | -40 ÷ +85 |
| ʃʇ60 ʇʦ 69, ʃʇ80 ʇʦ 85 | | -60 ÷ +200 | -60 ÷ +135 | -60 ÷ +85 |
| 070, 071 | | -40 ÷ +350 | ð | ð |
| 002 ʇʦ 005 | | -40 ÷ +200 | ð | ð |

**12. ʉʦʇʇʞʤ ʝʘʱ ʗʦ ʦʦʘʦʝʜʞʔʃʗʷ ʘʦʜʳ ʗ ʇʳ ʤʗ** ʇʦ ʇʇʊʊ 14254-96 ʗ ʇ ʃ ʂ 60529-89 ʃʦʦʘʞʦʃʘʑʞʦʝʤʘʞʤ-ʤʷ ʑʃʘʝ ʘʤʤ ʤʘ ʃʞʜʑʱ ʞʔ ʦʙʤʑʄʞ

[illegible] 14

| [illegible] | [illegible] 14254 | [illegible] |
|---|---|---|
| [illegible]000 [illegible] 005, 070, 071 | IP40 | [illegible] >1 [illegible] |
| 10, 11, 13 | IP55 | [illegible] |
| 20, 22, [illegible]050 [illegible] 069, [illegible]080 [illegible] 085 | IP65 | [illegible] |
| 14, 21, [illegible]23 [illegible] 29 | IP66 | [illegible] |
| 15, 16, 17, 18, 19 | IP66/IP68 | [illegible] 1 [illegible] |

**13.** [illegible] 01.01, 01.02, 01.03, 01.04, 01.05, 01.06, 01.07, 01.08, 01.09, 01.10, 01.10[illegible], 01.11, 01.14, 01.16, 02.01, 02.02, 02.03, 02.06, 02.07, 02.09, 02.10, 02.11, 02.14, 03.07, 03.08, 03.17, 03.18 [illegible]:

[illegible] MS[illegible]-64 [illegible] 70 [illegible]

[illegible] MSK-64 [illegible] 70 [illegible] 1 [illegible] 30 [illegible]).

**14.** [illegible]

[illegible] 60 [illegible] +120°[illegible] [illegible]

**15.** [illegible] **Exia, Exd**

[illegible] Ex, [illegible] Ex, [illegible] Ex, [illegible] Ex, [illegible] Ex ([illegible] 4211-002-10854341-2013) [illegible] 012/2011 «[illegible]» RU C-RU.[illegible] 06.[illegible] .00262 [illegible] 18.05.2019, [illegible] RU.0001.11[illegible] 06.

[illegible] Ex, [illegible] Ex, [illegible] Ex, [illegible] Ex, [illegible] Ex [illegible]:

- [illegible] 012/2011 «[illegible]»;
- [illegible] 30852.13-2002 «[illegible] 14. [illegible]»;
- «[illegible]» ([illegible] 7.3);
- «[illegible]» ([illegible] 3.4);
- [illegible] 4211-002-10854341-2013.

[illegible] «ia». [illegible] 15

| [illegible] | [illegible] |
|---|---|
| [illegible] Exd, [illegible] d, [illegible] Exd, [illegible] Exd, [illegible] Exd | 1ExdIICT4[illegible] T6 X |
| [illegible] Exi, [illegible] i, [illegible] Exi, [illegible] Exi, [illegible] Exi | 0ExiCIICT4[illegible] T6 X |

[illegible] PR Elec-tronics [illegible] 012, [illegible] 012.

[illegible]

[illegible] 0[illegible]iaIICT6 [illegible] DIN-[illegible]

[illegible] 012, [illegible] В [illegible] осуществляется [illegible]

настоящего Федерального стандарта.

**16. Библиография**

Библиография приведена в конце настоящего Федерального стандарта:

[1] Приказ Минтранса России от 04.06.2012 № 167;

[2] Приказ Минтранса России от 21.08.2012 № 311;

[3] Федеральные авиационные правила «Организация планирования использования воздушного пространства Российской Федерации», утвержденные приказом Минтранса России от 16.01.2012 № 6;

[4] Федеральные авиационные правила «Организация планирования использования воздушного пространства Российской Федерации», утвержденные приказом Минтранса России от 16.01.2012 № 6;

[5] Приказ Минтранса России от 08.11.2012 № 338;

[6] Федеральные авиационные правила «Организация планирования использования воздушного пространства Российской Федерации», утвержденные приказом Минтранса России от 16.01.2012 № 6;

[7] Приказ Минтранса России от 03.08.2015 № 232 «Об утверждении Федеральных авиационных правил «Требования к авиационной электросвязи в Российской Федерации» и о внесении изменений в Федеральные авиационные правила «Организация планирования использования воздушного пространства Российской Федерации», утвержденные приказом Министерства транспорта Российской Федерации от 16 января 2012 г. № 6».

**17. Разработчики федерального стандарта (РЭГ 1)**

Федеральный стандарт разработан рабочей группой по подготовке федерального стандарта по использованию воздушного пространства (РЭГ 1).

## Руководитель рабочей группы

1. Начальник Управления организации воздушного движения Федерального агентства воздушного транспорта Минтранса России.

2. Начальник Управления организации воздушного движения Федерального агентства воздушного транспорта Минтранса России.

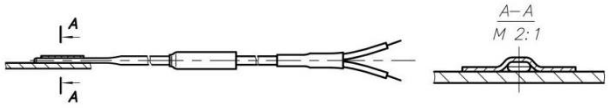
3. Начальник Управления организации воздушного движения Федерального агентства воздушного транспорта Минтранса России.

4. Начальник Управления организации воздушного движения Федерального агентства воздушного транспорта Минтранса России.

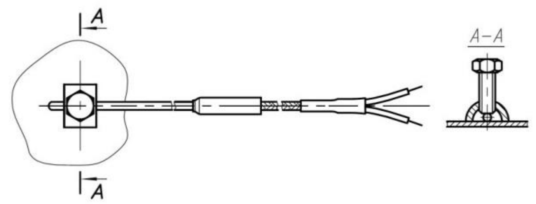
5. Начальник Управления организации воздушного движения Федерального агентства воздушного транспорта Минтранса России.

6. Начальник Управления организации воздушного движения Федерального агентства воздушного транспорта Минтранса России.

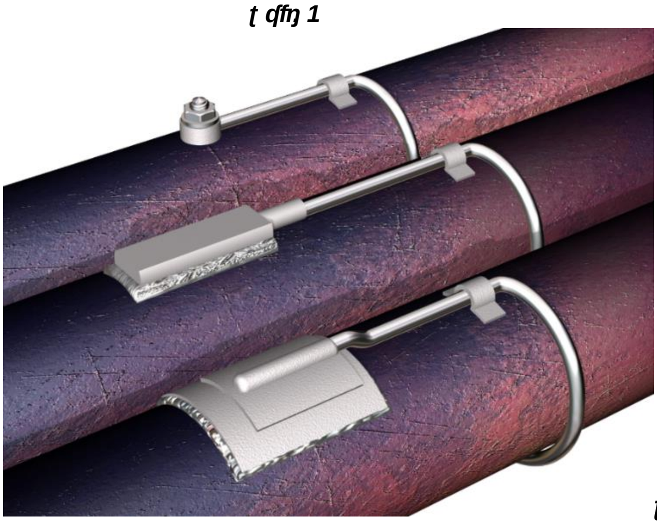
7. Начальник Управления организации воздушного движения Федерального агентства воздушного транспорта Минтранса России.

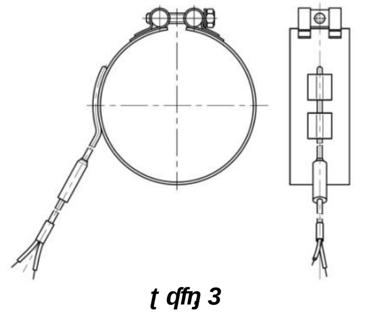



[illegible] 1




[illegible] 2





[illegible] 3

[illegible]4.

**[illegible]**

**1. [illegible]**

[illegible] 8.338-2002 [illegible]

[illegible] 8.338-2002 [illegible]

[illegible] 8.338-2002) [illegible] ASTM International E220-02, [illegible] 6.3 [illegible] (EAL-G31) [illegible]

[illegible] SAE AMS [illegible] 2750D [illegible] MNL-12 [illegible]

[illegible]

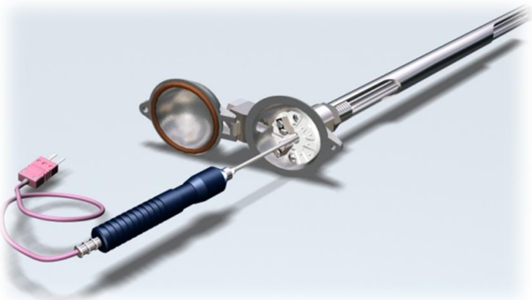
**2. [illegible]**

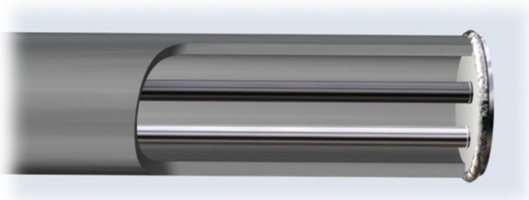
[illegible]

1. [illegible] 21.05–21.08, 21.16, 21.20, 21.21, [illegible] 01.05–01.08, 01.16, 01.20, 01.21 [illegible] 57177-14, [illegible] 54886, [illegible] 4211-002-10854341-2013.

[illegible]

**[illegible] 21.ММ [illegible] 2299408.**





2. [illegible] 12 [illegible] 2007 [illegible] 3091-2007 [illegible].

[illegible] 3091-2007 [illegible] 8.338.

**[illegible] 2325622.**

**3. [illegible] 3-[illegible] 21.ММ, [illegible] 200 [illegible] 1100°C.**

[illegible] 9 [illegible].

[illegible] 36735-08, [illegible] 30380, [illegible] 4211-012-10854341-07.

**[illegible] 39200.**

4. [illegible] HH506RA [illegible] ± (0,05%([illegible])+0,4)°[illegible].

[illegible] 37531-08, [illegible] 31188.

[illegible]

[illegible] 2011 [illegible] 20 ASTM International [illegible] E2846 - 11 «Standard Guide for Thermocouple Verification» ([illegible]). [illegible]