

:
911B, 912B



rev B



: 911B-900, Rev. B
2018 1



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()

911B-900

B, 2018 1

: A 2017 11



TEGAM, Inc.

10 TEGAM Way

Geneva, OH 44041



(AS IS)



TEGAM

tegam.com

FAR 12.211() FAR

12.212(),

DFARS 252.227-7015(-)

DFARS 227-7202-3(

)

1.	.....	1- 1
1.1	.....	1- 1
1.2	()	1- 2
1.3	TEGAM	1- 3
2.	.....	2- 1
2.1	.....	2- 1
2.2	.....	2- 1
2.3	.....	2- 2
2.4	.....	2- 4
2.5	.....	2- 4
2.6	.....	2- 5
3.	.....	3- 1
3.1	.....	3- 1
3.2	LCD	3- 1
3.3	.....	3- 3
3.4	.....	3- 4
3.5	.....	3- 5
3.6	.....	3- 6
3.7	.....	3- 6
3.8	.....	3- 6
3.9	.....	3- 6
3.10	.....	3- 6
3.11	Open Wire Detection() /	3- 7
3.12	.....	3- 8
3.13	.....	3- 8
4.	.....	4- 1
4.1	.....	4- 1
4.2	.....	4- 1
4.2.1	.....	4- 1
4.2.2	.....	4- 2
4.3	.....	4- 5
4.4	.....	4- 7
4.5	.....	4- 7
4.6	.....	4- 8
4.7	.....	4- 9
4- 10	.....	4- 10
.....	.....	4- 10
A.	.....	i
B.	.....	i
C.	.....	i

1.

1.1

	$\pm(0.04\% | \text{rdg}| + 0.3 \text{ } ^\circ\text{C})^1$		
	ITS-90		
	°C	°F	K
K	-200 ~ 1372	-328 ~ 2502	73 ~ 1645
J	-210 ~ 1200	-346 ~ 2192	63 ~ 1473
T	-250 ~ 400	-418 ~ 752	23 ~ 673
E	-250 ~ 1000	-418 ~ 1832	23 ~ 1273
	1 Mini-TC(911B)	2 Mini-TC(912B)	
(0)	0.1 °C/°F/K		
	4 LCD(, , , , , , , ,)		
	4 LED (30)		
	0.1° <1000°	1 ° ≥ 1000°	
	3 / ()		
	3 AA(IEC LR6, ANSI 15)		
	2000		
	4		
	T1-T2(912B)		
	8 ()		
	:		
	-		
	-		
	-		
	± 50 nA		
	42 V	1 V p- p(T1 T2)	
	CE(2014/30/EU) / RoHS2(2011/65/EU)		
ESD	IEC 61000-4 2:2009, B		



1.3 TEGAM

	911B	,
	912B	,
	931B	,
	932B	,

2.

2.1

TEGAM 911B 912B

4 NIST : E, J, K, T.

2.2

-
- 2000
- 4 LCD(LED)
- 8 NIST : E, J, K, T.
- MIN, MAX, AVG, RNG, STDEV, T1-T2.²
-
-
- 0.1° / 1°
- °F, °C, K
- HOLD()
- ITS- 90
- : MIL- PRF- 28800F, 2
- / /
-
-
-
-
-

¹

² T1- T2 912B



2.3



42V()

TEGAM 921A 922A

(ESD)



() 1V

AA(IEC LR6, ANSI 15)





2.4

TEGAM

TEGAM

TEGAM

- 1
- 1
-
- AA, 1.5V 3
- ().

2.5

3 AA 1.5 V



: Phillips

1. (1)

2. 2

3.

4.

5. 3 AA (IEC LR6, ANSI 15)

6. , 2

7. , 30



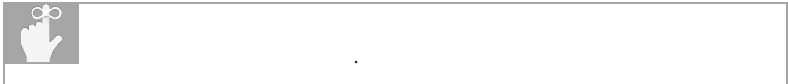
1:

2.6

TEGAM 900 Series

1. *2.5, Battery Installation and Replacement*

2. Channel 1(1) / Channel 1(2)



3.



4

4.

a. **SET** Set up Menu() , 1.5

b. (E, J, K, T)  

c. **SET** ()

d. (°C, °F, K)  

e. **SET**



f. Channel 1 (1)



Channel 1
3.10, Probe Offset

g.

Channel 2 ()

h. Channel 2 (f)

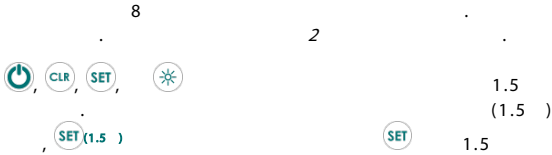
i.

!

TEGAM

3.

3.1



		ON() OFF()
		Setup Menu()
		Setup Menu()
		/
		30
	Setup Menu()	,
	Setup Menu()	,
	Setup Menu()	,
	Calibration()	1.5

2:

3.2 LCD



		<table border="1"> <tr> <td>1</td> <td>HOLD()</td> </tr> <tr> <td>2</td> <td>T 1 T 2 OFFSET 1</td> </tr> <tr> <td>3</td> <td>Channel 1</td> </tr> <tr> <td>4</td> <td></td> </tr> <tr> <td>5</td> <td></td> </tr> <tr> <td>6</td> <td></td> </tr> <tr> <td>7</td> <td>Channel 2 2, T 1 - T 2</td> </tr> <tr> <td>8</td> <td></td> </tr> </table>	1	HOLD()	2	T 1 T 2 OFFSET 1	3	Channel 1	4		5		6		7	Channel 2 2, T 1 - T 2	8	
1	HOLD()																	
2	T 1 T 2 OFFSET 1																	
3	Channel 1																	
4																		
5																		
6																		
7	Channel 2 2, T 1 - T 2																	
8																		
9	Open Wire Detection()																	
10	Setup Menu()																	
11																		
12	Channel 2 2																	
13	Channel 2																	
14	Channel 2 2																	
15	T 1 - T 2 2																	
16	Channel 1																	
17	Channel 1																	
18	Channel 1																	

¹ T 2 Probe Offset() 912B

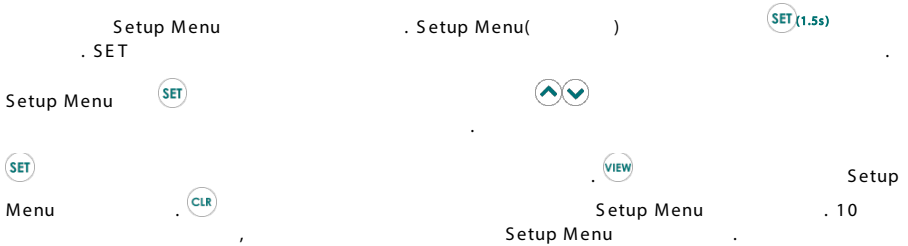
² Model 912B

3: LCD

OPEn	
- Or-	:
- Ur-	:

4: LCD

3.3



5 below

1. Setup Menu
2. 5
- 3.

Thermocouple Type()	E, J, K, T.
Temperature Units()	°C, °F, K
T 1 Probe Offset(T 1)	± 0.1°
T 2 Probe Offset(T 2) ¹	± 0.1°

4.

Open Wire Detection()	ON(), OFF()
T 2 Probe Offset()	912B

SET (1.5s)

5: Setup Menu

5.

Setup Menu

VIEW

6.

Setup Menu

CLR

	10	Setup Menu
--	----	------------

3.4

6

T 1-T 2	T 1- T 2	Channel 1 - Channel 2
	MIN	
	MAX	
	AVG	
	RNG	-
	ST DEV	1.

$$1 \quad \therefore = \sqrt{\frac{\sum(x - \mu)^2}{n}}$$

6:

VIEW

2

T 1-T 2

Channel 1

Channel 2

T 1-T 2

, T 1-T 2



CLR (1.5)

HOLD

HOLD

CLR (1.5s)

VIEW

, LCD T1 T2

7



CLR (1.5s)



Channel 1

911B	T1	MIN	MAX	AVG	RNG	ST DEV
912B	T1	MIN	MAX	AVG	RNG	ST DEV
	T2	MIN	MAX	AVG	RNG	ST DEV
7:						

VIEW

3.5



(1.5)

(: CLR (1.5)

1.5

20

CLR (1.5s)



3.6

LED



30



3.7



HOLD() LCD



3.8

3.9



3

8

0

bATT

0

2.5, Battery Installation and Replacement

3.10

3	100% - 50%
2	50% - 20%
1	20% - 5%
0	0% -

8:

Channel 1 2





1. Channel 1 Channel 2()

2. 3

3.

4. Setup Menu



5. 3 Channel 1 Offset

6. Channel 1 ,

7. 0.1°

8. Channel 2 (912B) Setup Menu

a. Setup Menu

9. **OFFSET**() LCD

1. Setup Menu

2. 3 Channel 1 Offset

3.

4. 0.1°

5. Channel 2 (912B) Setup Menu

a. Setup Menu

6. **OFFSET**() LCD

3.11 Open Wire Detection() /

Open Wire Detection()

Open Wire Detection() . Open
Wire Detection()

	Open Wire Detection	, OPEN
--	---------------------	--------

Open Wire Detection :

1. Setup Menu
2. 931B (4) , 932B (7) Open Wire Detection
3. "OWD OFF" LCD Open Wire Detection Line
2
4. Line 2 Open Wire Detection()
 - a. ON Open Wire Detection
 - b. OFF Open Wire Detection
5. Open Wire Detection Setup Menu
 - a. Open Wire Detection Setup Menu
6. Open Wire Detection "OWD OFF"

3.12

. LCD

CLr

		Thermometer Link	TEGAM
Cloud			

Setup Menu Setup Menu

3.13

LCD 9

- Or -	



- Ur -	
OPEn	

9:

4.

4.1

)
 / / ()
)

4.2

4.2.1

1. $23 \pm 1^{\circ}\text{C}$ 5% ~ 95% RH
2. ("UUT") 4
3. A B UUT
4. C
5. Thermocouple Cable(), Thermocouple Calibrator()
6. 2 UUT
7. UUT 10 UUT
3.3, Setup Menu


Thermocouple Type()	
Temperature Units()	°C
Ch. 1	0.0 °C
Ch. 2(912B)	0.0 °C
Open Wire Detection(/)	(3.11, Open Wire Detection On/Off)

10: UUT

8. UUT Channel 1
 - a. UUT Channel 1 2 UUT Channel 2 UUT
9. Thermocouple Calibrator()
10. Thermocouple Calibrator()

11. 5
12. C Standard Value()
13. Standard Value UUT C
14. C Cable Correction()
15. Reading() Cable Correction() C
Corrected Reading() (Reading() - Cable Correction()) =
Corrected Reading()
16. Corrected Reading() C 2- Sigma Tolerance(2)
UUT
17. C Standard Value() 12 ~ 16
18. 7 ~ 17
19. 7 above Open Wire Detection() Off() , 3.11,
Open Wire Detection On/Off

4.2.2

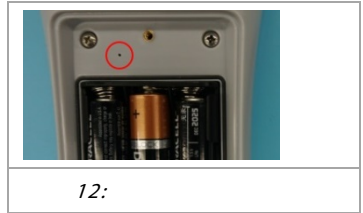
1. 23 ± 1°C 5% ~ 95% RH
2. ("UUT") 4
3. A B UUT
4. UUT
5. UUT  UUT
6. *Figure 11* UUT UUT
3.3, Setup Menu

Thermocouple Type()	E ¹
Temperature Units()	°C
Ch. 1	0.0 °C
Ch. 2(912B)	0.0 °C
¹ Cold Junction Compensation() UUT J J B E	

11: UUT

7.

Figure 12



8. UUT

- a. Line 1: CAL1
- b. Line 2: mV portion of Channel 1 voltage reading (Channel 1 mV)
- c. Line 3: nV portion of Channel 1 voltage reading (Channel 1 nV)

9. Mini-TC

- a. Mini-TC UUT Channel 1, UUT Channel 2

10. Mini-TC (Mini-TC)

11. 3

	80mV DC	UUT	. 80mV
--	---------	-----	--------



12. Figure 13 Applied Voltage()




13.

14. UUT

15. UUT

16. UUT  UUT Applied Voltage(), ±0.001mV

- a. UUT Applied Voltage() ±0.001mV
Applied Voltage UUT
±0.001mV  

- b. UUT  UUT 8999 - 999
CAL   (1.5) 1.5

17. UUT  rES1 [2, 3 ...]

18. UUT  CAL

19. *Figure 13* Channel 2 12 ~ 18 UUT

a. Mini-TC Channel 1 Channel 2 UUT Channel 1 Channel 2 *Figure 13* CAL4 UUT

	UUT	(mV)
1	CAL1	- 10
	CAL2	75
	CAL3	- 10
	CAL4	30
2	CAL5	- 10
	CAL6	75
	CAL7	- 10
	CAL8	30

13:

20. UUT

Cold Junction Compensation()

21. E.⁴ UUT Channel 1






a. UUT Channel 1 Channel 2 UUT Channel 1 Channel 2 UUT

22. Thermocouple Calibrator()

UUT :

- a. Line 1: CALA
- b. Line 2: temperature in °C (°C)
- c. Line 3: temperature in tenths of °C (°C 1/10 , 1µ 0.000001°C)


23. Thermocouple Calibrator() E.⁵

- 24. 0.0°C
- 25. 5
- 26. UUT   ± 0.02°C UUT
- 27. UUT 
- 28. rESA
- 29. UUT 35
- 30. 2 UUTs , 31
 - a. Channel 1 , Channel 2 UUT , UUT 25
- 31. UUT 
- 32. UUT :
 - a. Line 1: CALb
 - b. Line 2: temperature in °C (°C)
 - c. Line 3: temperature in tenths of °C (°C 1/10 , 1μ 0.000001°C)
- 33. 26 27
- 34. rESb
- 35. UUT  UUT



4.3

TEGAM

14

2	Line Statistics View Mode()	 () <i>3.4 View Modes and Statistics</i> ()



		(3.10, Probe Offset)
		(3.8 Trend Indicators)
		(3.3, Setup Menu)
	Open Wire Detection()	3.11, Open Wire Detection On/Off
	Hold Mode()	 , HOLD (3.7, Hold Function)
		
		(2.5, Battery Installation and Replacement)

14:

4.4

LCD

. LCD

15

Err ADC	
Err CJC	
Err FLSH	
Err InP	

15:

4.5

CLR (1.5s)

3.12, Clear Function

3.3, Setup Menu



4.6

TEGAM RMA(Returned Material Authorization;) TEGAM
() (www.tegam.com) , 440-466-6100() 800-666-1010
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RMA , RMA



4.7

RMA :		:	
:		:	
:		:	
:			

:

ISO 17025

:



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TEGAM, Inc
(National Institute of Standards and Technology, NIST)
International System of Units(SI)

A.

		(2- SIGMA)	
		- 10 ~ 75mV	± (30ppm + 2μV)
1, 2	Thermocouple Type E	- 250 ~ - 201 °C - 200 ~ - 101 °C - 100 ~ - 1 °C 0 ~ 599 °C 600 ~ 1000 °C	± 0.26 °C ± 0.13 °C ± 0.11 °C ± 0.10 °C ± 0.12 °C
	Thermocouple Type J	- 210 ~ - 101 °C - 100 ~ 799 °C 800 ~ 1200 °C	± 0.15 °C ± 0.11 °C ± 0.12 °C
	Thermocouple Type K	- 200 ~ - 101 °C - 100 ~ 799 °C 800 ~ 1372 °C	± 0.17 °C ± 0.12 °C ± 0.14 °C
	Thermocouple Type T	- 250 ~ - 201 °C - 200 ~ - 101 °C - 100 ~ - 1 °C 0 ~ 400 °C	± 0.36 °C ± 0.17 °C ± 0.12 °C ± 0.11 °C
	1μV	2- Sigma	B
	UUT	(male)	
	2 UUT	Y	2 (male)
Mini- TC	Mini- TC	Voltage Gain()	Offset()
	UUT	(male)	
	2 UUT	Y	2 (male)
			0.8mm

¹ Fluke 7526A AA

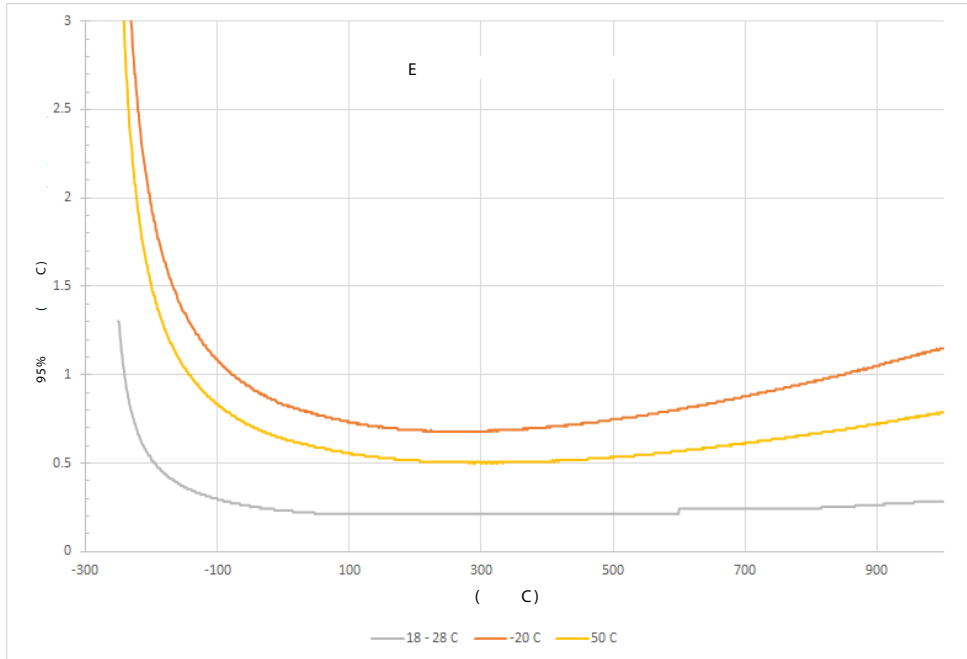
² "Specification(2- Sigma)"

1/100

A:

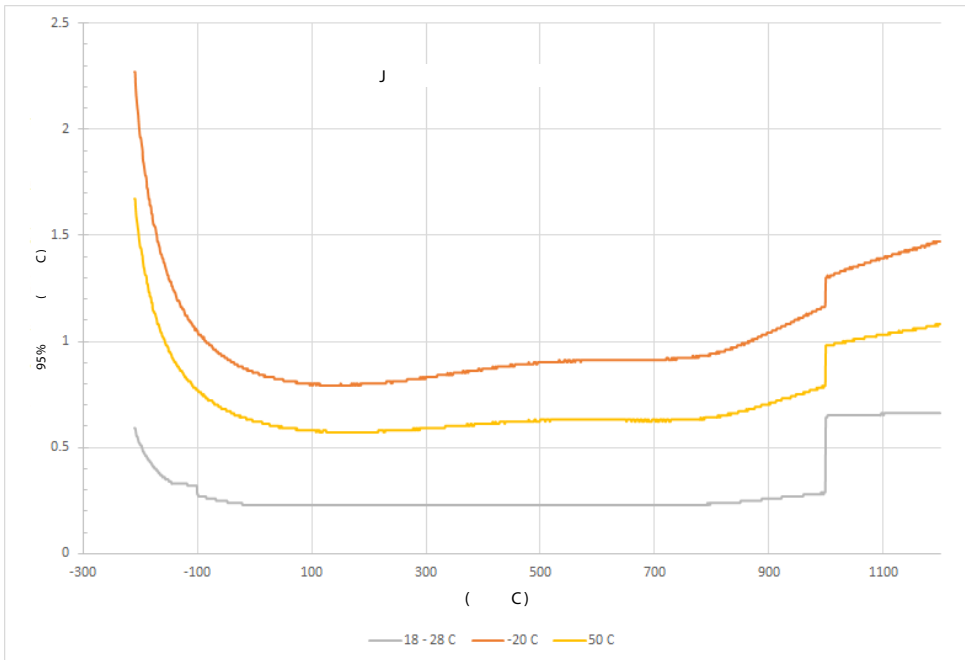
B.

E



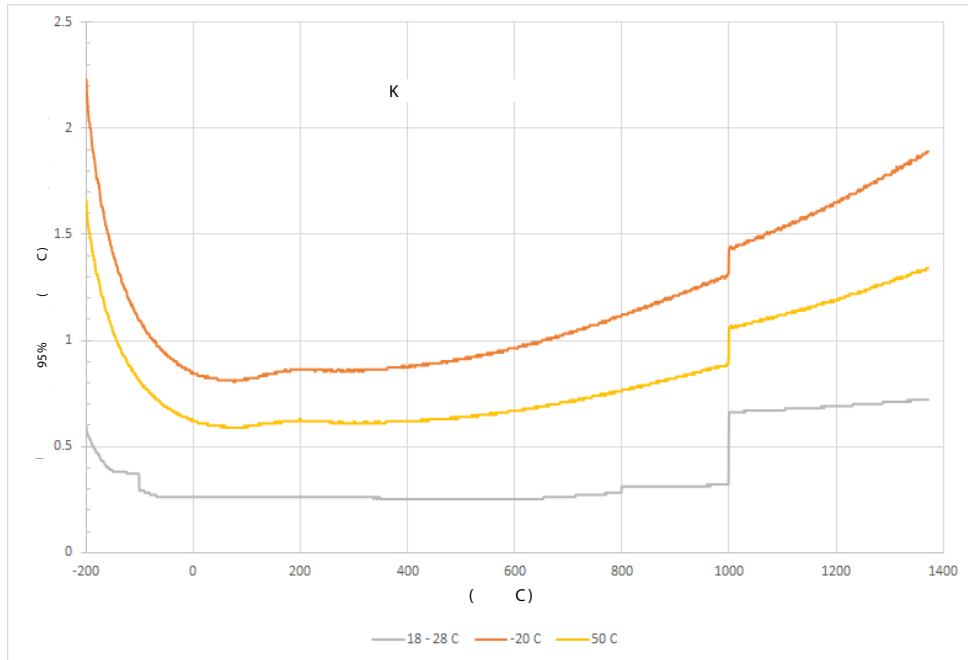
B-i

J



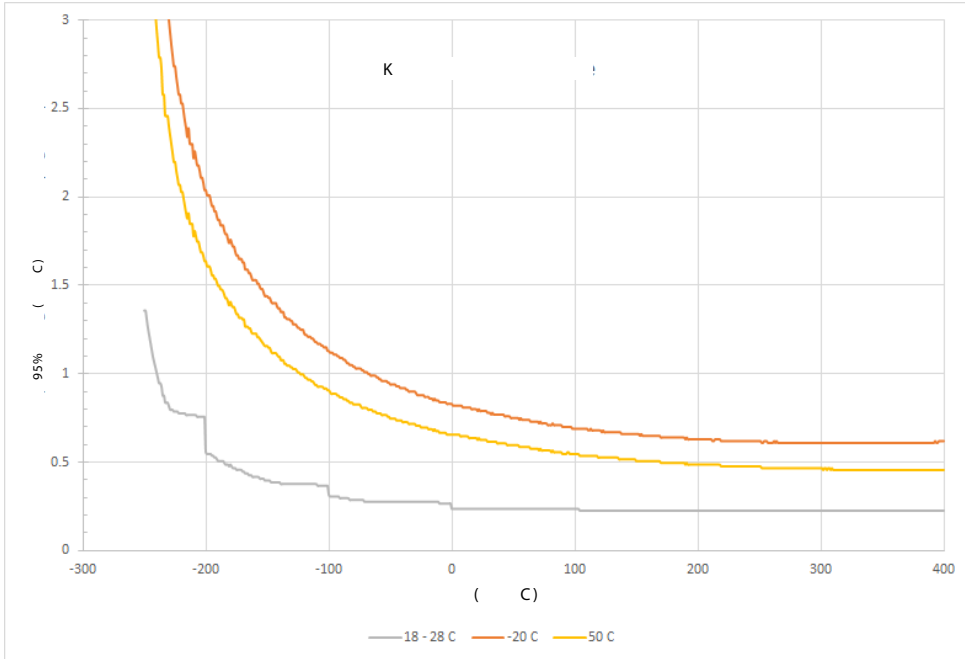
B-ii

K



B-iii

T



B-iv

C.

	(°C)	(°C)	(°C)	(°C)	2- SIGMA (± °C)
E	- 250				1.30
	- 95				0.29
	0				0.23
	995				0.28
J	- 210				0.59
	- 95				0.27
	0				0.23
	995				0.28
	1200				0.66
K	- 200				0.59
	- 95				0.29
	0				0.26
	995				0.32
	1372				0.72
T	- 250				1.36
	- 95				0.31
	0				0.24
	400				0.23

C:

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