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V303 95# V304 V305

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2.8 23
2.9 24
2.10 63

3 65

3.1 65
3.2 65
3.3 77
3.4 85
3.5 87
3.6 93

4 102

4.1 102
4.2 103
4.3 103

5 105

5.1 105
5.2 114
5.3 122
5.4 124
5.5 133

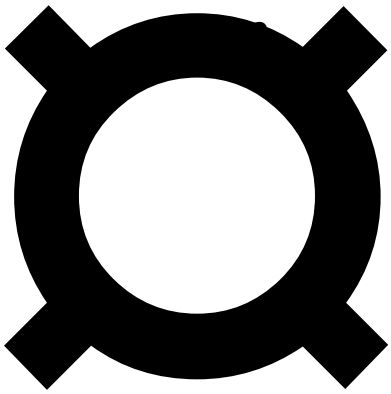
6 136

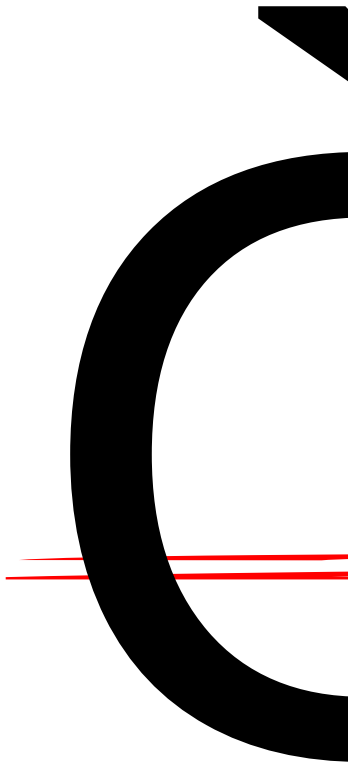
7 175

7.1 175

7.2 180
7.3 185
8 190
9 194

1.2.1





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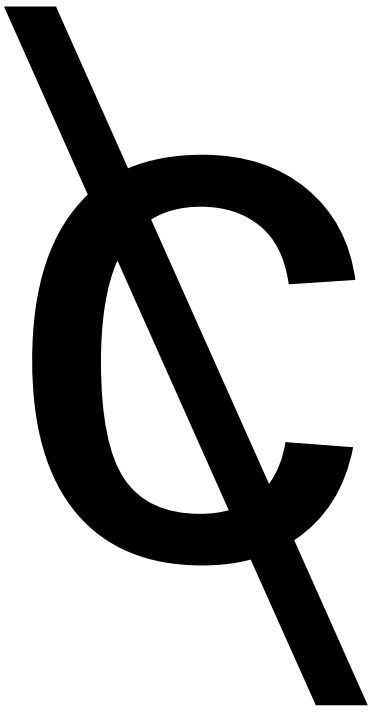

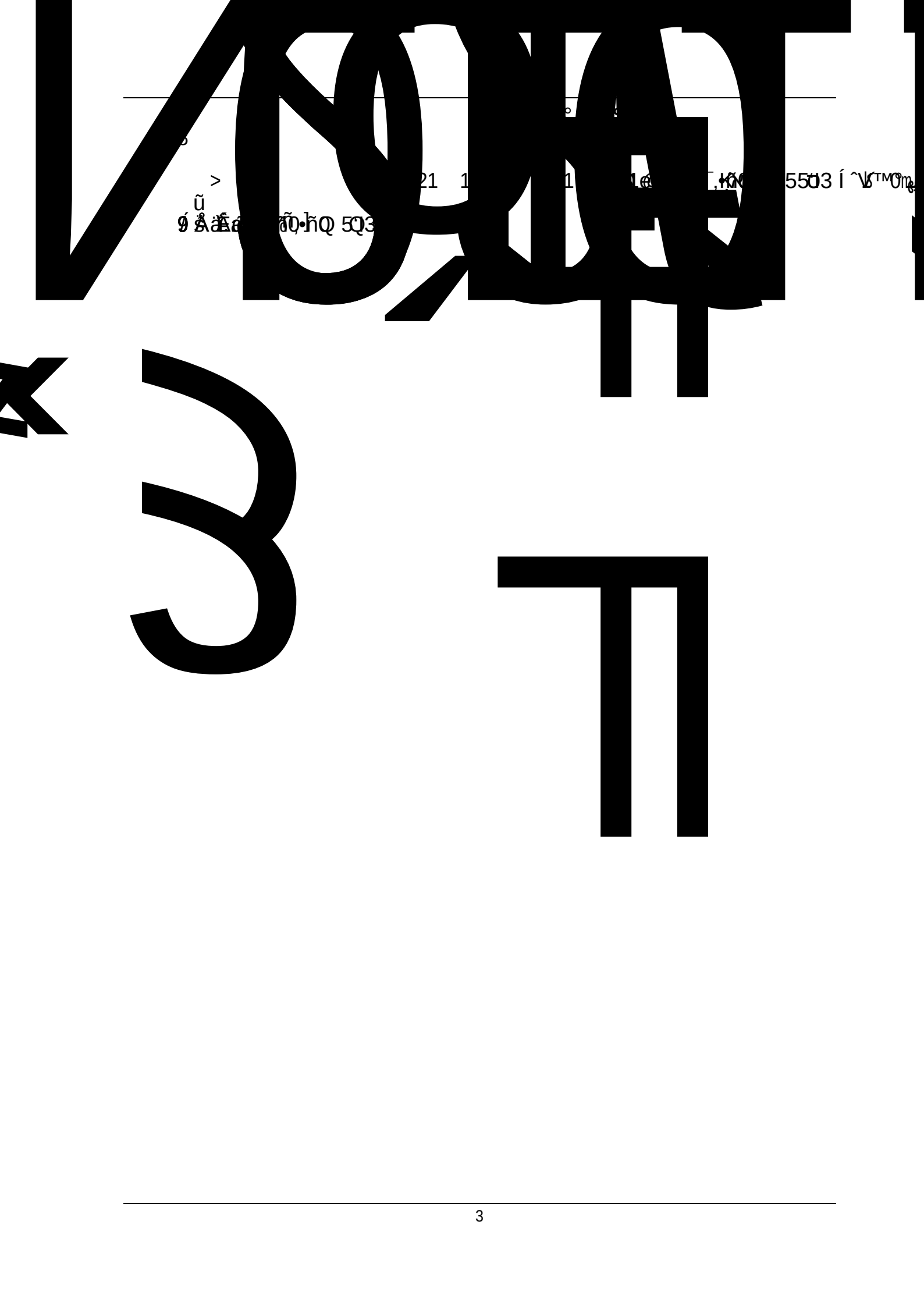

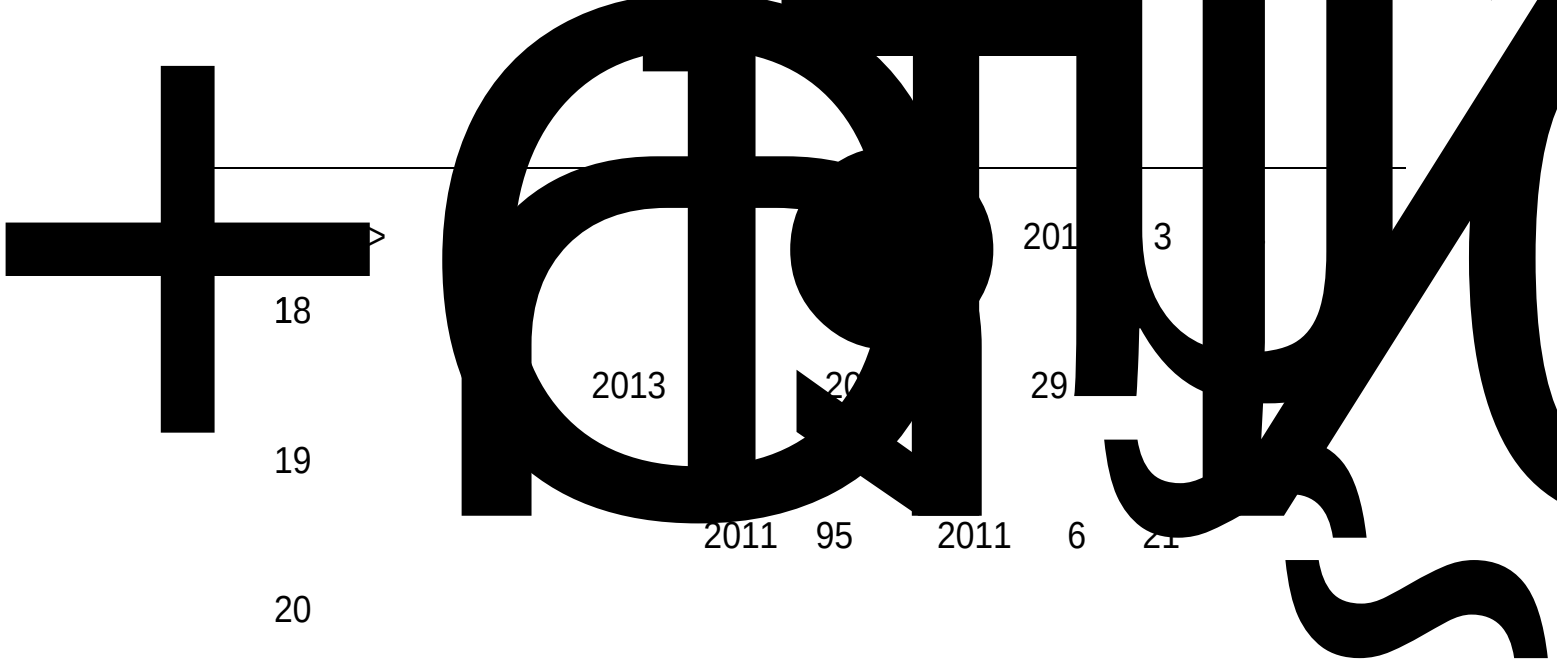

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34 GB55036-2022

35 GB6944-2012

36 GB50974-2014

37 - TSGD0001-2009

38 GB50093-2013

39 GB17914-2013

40 GB/T13869-2017

41 GBZ/T230-2010

42 HG20571-2014

43 1 GB39800.1-2020

44 GB50052-2009

45 GB50191-2012

46 GB50303-2015

47 2024 GB50011-2010

48 2018 GB50016-2014

49 GB50034-2013

50 AQ/T9009-2015

51 GB/T12801-2008

52 GB5083-1999

53 GB50014-2006 2016

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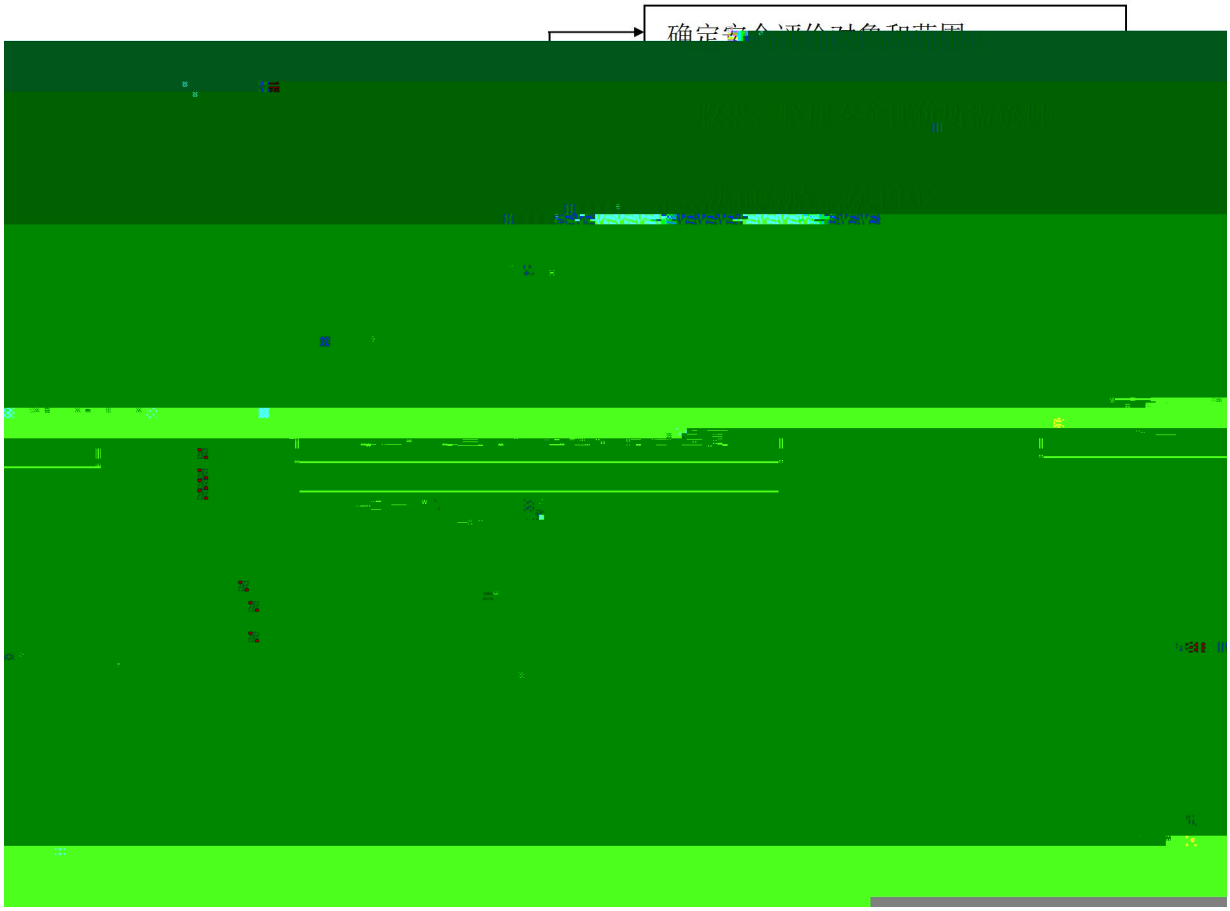

1.4-1

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2.4.1

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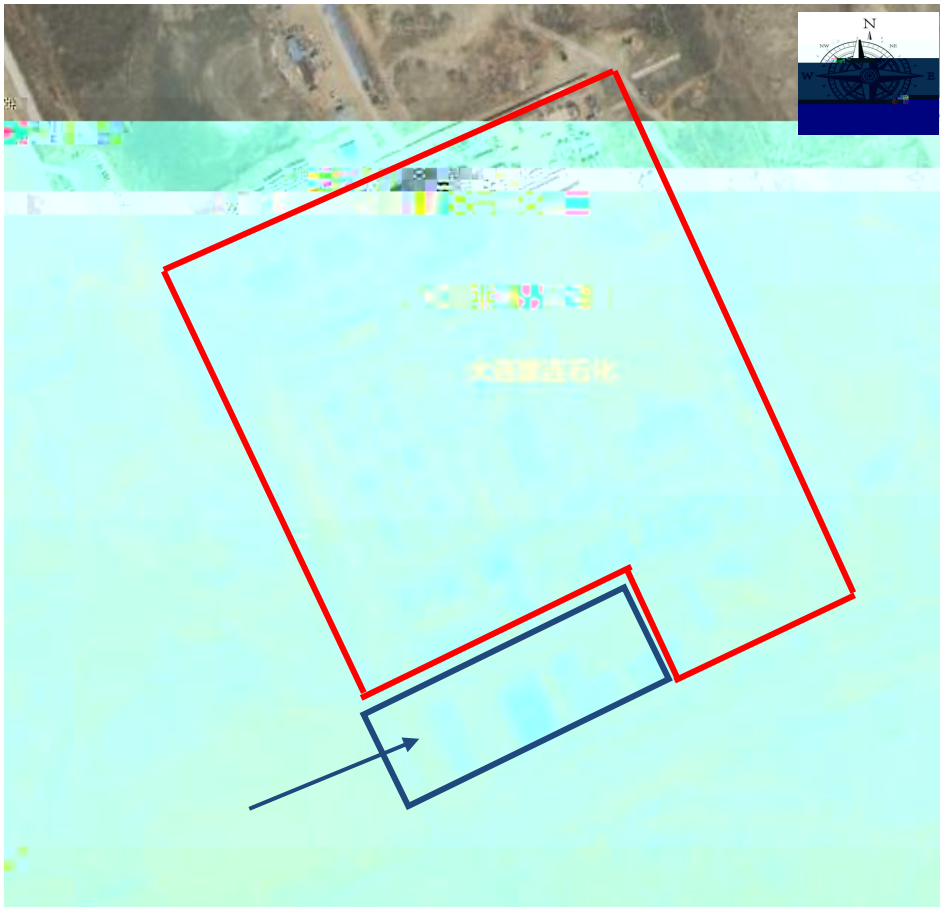

2.4.1-1

2.4.1-2

2.4.2

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2.5.1

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10m 12m 5m

2.5.1-1 B 2.5.1-2

2.5.1-3.

2.5.2

2.5.2-1

2.5.2-1

			m	m²	m²				
1									
2									
3	H=18m						/	/	
4									
5								/	
6	B						B	/	
7	/							/	
8									

2.6.1

< (2024)>

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2.6.2

2.6.3

2.6.5

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1 2000m³MTBE V301

V303 1 20

2.6.5-2 2.6.5-3 2.6.5-4 2.6.5-5 2.6.5-6

2.6.5-2

							( )	MPa	
1	PL10202-2	1.6A1	DN150	PL10202	PL10203-2	MTBE/	30	0.52	GC2
2	PL10202-3	1.6A1	DN150	PL10202	PL10203-3	MTBE/	30	0.52	GC2
3	PL10214	1.6A1	DN100	P304	V305		30	0.3	GC2
4	PL10215	1.6A1	DN100	PL10215-1 PL10215-2	V304		30	0.3	GC2
5	PL10215-1	1.6A1	DN100	P303	PL10215		30	0.3	GC2
6	PL10215-2	1.6A1	DN100	P304	PL10215		30	0.3	GC2
7	PL10216	1.6A1	DN100	P303	PL10216-1 PL10216-2	MTBE	30	0.3	GC2
8	PL10216-1	1.6A1	DN100	PL10216	V301	MTBE	30	0.3	GC2
9	PL10216-2	1.6A1	DN100	PL10216	V302	MTBE	30	0.3	GC2

2.6.5-3

				mm	(MPa)	(MPa)	(MPa)		( )	
1	PSV2301	A42Y-16P	1	32	1.6	0.12	0.1	MTBE		VT10201-32-1.6A1
2	PSV2302	A42Y-16P	1	32	1.6	0.12	0.1			VT10202-32-1.6A1
3	PSV2303	A42Y-16P	1	32	1.6	0.12	0.1			VT10203-32-1.6A1
4	PSV2304	A42Y-16P	1	32	1.6	0.12	0.1			VT10204-32-1.6A1
5	PSV2305	A42Y-16P	1	32						

2.6.5-5

				(MPa)	( )	(kPa)	(kPa)	( )			
1	PM2301	1	DN500	1.6	30	1.8	1.96	50	Q235B	MTBE	V301
2	PM2302	1	DN500	1.6	30	1.8	1.96	50	Q235B	95#	V302
3	PM2303	1	DN500	1.6	30	1.8	1.96	50	Q235B	95#	

2.7

2.7.1

2.7.1-1

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(t/a)

1 1 1

1 5 28 1

4 1

4

2022 52

2.9

2.9.1

1

GB5749-2022 0.4MPa DN300

Y

1700t/d 1000t/d

700t/d

1

50L/d 72

2.0 3.6m³/d

0.3m³/h

2

3

3.14×14×0.5×3=65.94m　　0.7L/(s.m)

65.94×0.7=46.158L/s

26.376+46.158=72.534L/s

B　　26.376+46.158=72.534L/s

2.9.1-1

1		100L/s 300L/s 1.4MPa 280kW 1480r/min	XBD14/100-280×7	3
2	7	S 150L/s 300L/s 1.4MPa		

4h

$72.534 \times 3.6 \times 4=1044.49m^3$

B 6 $2000m^3$ φ14×14

1 1

100L/s

300L/s

1 1.4MPa XBD14/100-280×7 3

280kW

1480r/min

7

S

150L/s

300L/s

1.4MPa

2

280kW

1500r/min

12V135Z

418kW

6		64L/s Pa 3% 5m³				
7		0.5MPa 8L/s ≥5	PCL8		12	2
8		4500m³ φ19000×18000 5000m³	--		2	

7d

(1.6MPa)

-0.1-0.7MPa

0.4 75% 175%

0.85MPa 1.05MPa

DN ≥ 50mm

RESP RESF

00-16

6 SSF150/80-1.6

5 2m

5m 60m

120m

60m

150m

SSF100/65-1.6 لد 10 PS150+PZ150-1.6

/ ≥ 60m/ 65m 1.3MPa 7

150m

SSF100/65-1.6 4

عم

150m

DN125

(15min)

t_1 5-15min 10min

t_2 min 5 min

185.385L/(s hm^2)

$Q=q\Psi F$

Q L/s

q 185.385L/(s hm^2)

Ψ 0.9

F 230.1m^2 3152.5m^2

33.

$_1+V_2$

V_2—— m^3

$V_2=\sum Q \quad t$

Q —— m^3/h

t —— h

V_3—— m^3

V_4—— m^3

V_5—— m^3

$V_5=10qF$

q—— mm

1.4m

GB 50351-2014 3.2.5

2000m³ 3.2.7 $V=AH_j-V_1+V_2+V_3+V_4$ H_j 0.95m

0.95+0.2=1.15 1.4 GB 50351-2014

3.2.6 2018 GB50160-2008

6.2.17 3152.5-7.0×7.0×3.14×6 ×1.4=3121.076m³

$V_1+V_2-V_3$ =-1.392<0m³

V1=0m³

V2=648m³

0m³

V1+V2-V3 =648m³

V1+V2-V3 max=648m³

V_4=0

q=qa/n=9.638mm

V=10qF=10×9.638×7.9686=768.014m³

768.014m³

648+0+768.014=1416.014m³

4500m³

u

2.9.3

2.9.4

2.9.4.2-1

2.9.4

2.9.5

1

R16IE_A8.5 2 R132I_A8.5

1 HDX-50 1 CFD-30/10 1

1400Nm³/h 0.8Mpa -30

150Nm³/h 800Nm³/h

450Nm³/h

5m³ 5m³ 3m³

3 14 MTBE/ /

B MTBE

MTBE

95# 95#

6.3Nm³/h

450Nm³/h

2

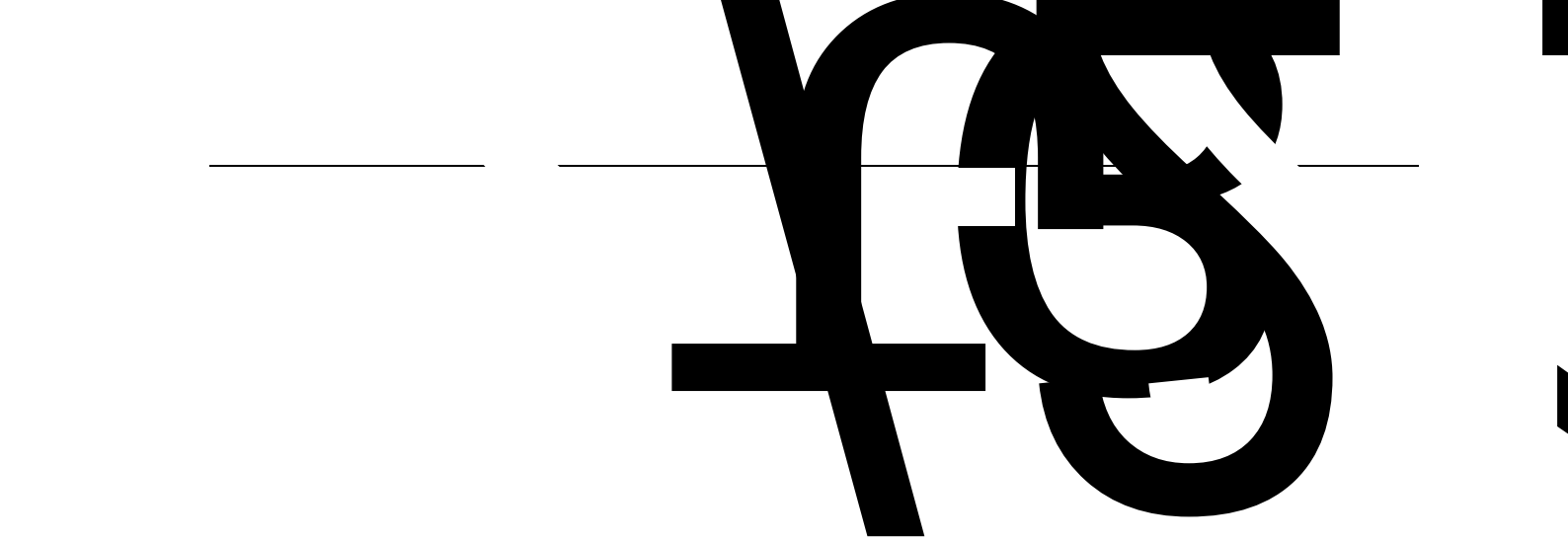
2 400Nm³/h 4m³

50Nm³/h

100mm 0.04W/(m K)

2000m³ 4W/(m² K) C 4

75Nm³/h 0.6MPa 25 5



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AQ3035-2010

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1 DCS

1 1

I/O I/O A/D(D/A)

DCS MCS DAS

DCS MCS

SCS DAS

DCS

DCS

DCS

DCS DCS

2 SIS

SIS

SIS

IEC61508 SIL3

1 1 1 1

1 1 I/O

1 1 CPU 50%

HAZOP

HAZOP

2024 4 19

(HAZOP) HAZOP :

1 2

DCS

2.9.6.1-1 SIL

	SIF	0SIF	0SIF	
1	SIF01	V301 MTBE		SIL1
2	SIF02	V301 MTBE		SIL1

	SIF	0SIF	0SIF	
3	SIF03	V302 95#		SIL1
4	SIF04	V302 95#		SIL1
5	SIF05	V303 95#		SIL1
6	SIF06	V303 95#		SIL1
7	SIF07	V304		SIL1
8	SIF08	V304		SIL1
9	SIF09	V305		SIL1
10	SIF10	V305		SIL1

SIL- “ ”

SILa “ PBCS SIS ” SIL1 3 “

SIS ”

HAZOP SIL SIS

SIS SIS

2.9.6.1-2

MPa

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2.9.6.4-1

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2.9.6.4-2

2.9.6.4-2

			( )	
1		( )	2	EXd CT4Gb
2	B	( )	7 3	EXd CT4Gb
			9	

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2.10.1

2.10.2

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3.2-1

3.2-1

			UN	CAS												
						=1	=1	( )	( )	(v/%)	(kJ/mol)	( )				
1	MTBE	1148	2398	1634-04-4		0.7405	3.1	53~56	-10	1.6~15.1	38103	B		3			--
2		2568	1170	64-17-5		0.789	1.59	78.3	13	3.3~19	1368	B		3			--
3		1964	1256	8030-30-6		0.75	3.2	165—200	34	0.6~6.5	47400	B		3			--
4		2740	1262	26635-64-3		0.698	3.9	99.2	-12	1~6	47847	B		3			--

		UN	CAS	=1	=1	( )	( )	(v/%)	(kJ/mol)	
										( )
5	95#	1630	1203	86290-81-5	0.732	3-4	20--			

3.2.1 MTBE

3.2-2 MTBE

88.15 -108.6
55.2 (=1)0.74 (=1)3.1 27kPa(20)
3360.7kJ/mol / 0.94 1.24 -28 375
1.6 15.1

1

2

3

1 30

2

1

2

	1 2 15min 15min 50m 300m

3.2.2

3.2-3

Naphtha Solvent

CnH2n+2(n=5 8)

-

UN 1823 CAS 8030-30-6

( ) -48 -26

( ) 165 200

( ) 34

[V/V] 6.5

=1 0.65 0.795

3.2

( ) 229 260

[V/V] 0.6

20

15min

CO CO2

1000㎥

1

2 (

( ) -109

( ) 99.2

( ) -12

[V/V] 6.0

=1 0.698

-

( ) 250

[V/V] 1.0

3.5.2

3.5-e

ethylalcohol

70.8A

5.3 5-12-A8 CAS

0.987 L=

1.52

1.5A3 ( )

[V1V]

		1.AII-	( )
		3.87	( )
		13	( )
	91	[V1V]	

	C2H6O		
UN	1170	CAS	64-17-5

3.2.6 [ ]

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3.3

3.3.1

MTBE 95#

95#

3.3.2

V301 MTBE V302/V303 95# 95#

V304/V305 B

3.3.3

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3.3.6

3.4

3.4.1

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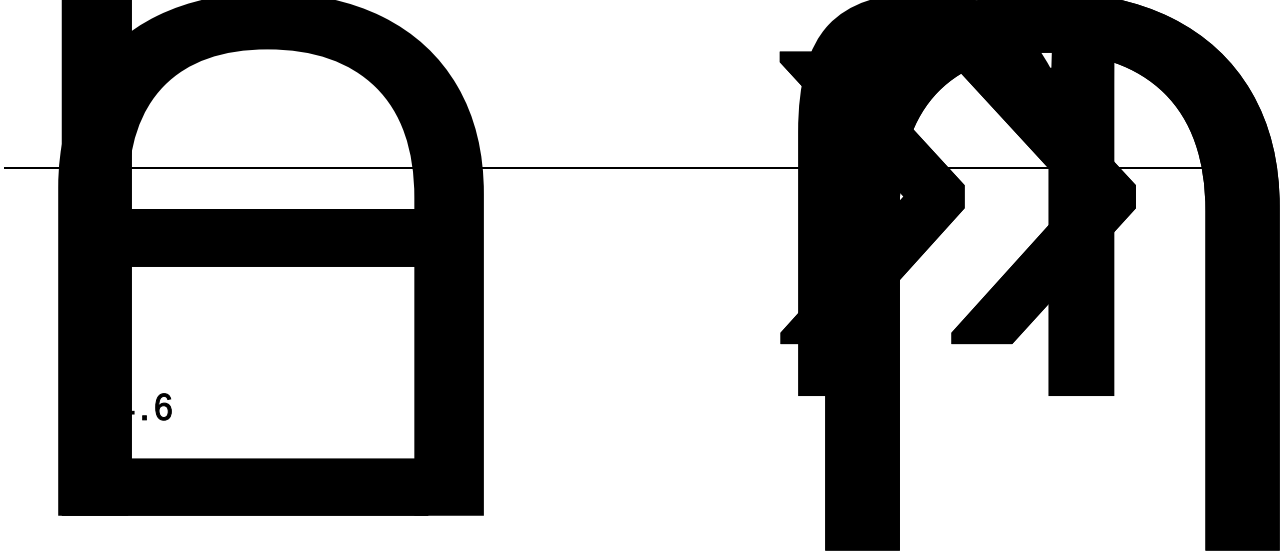
3.4.2



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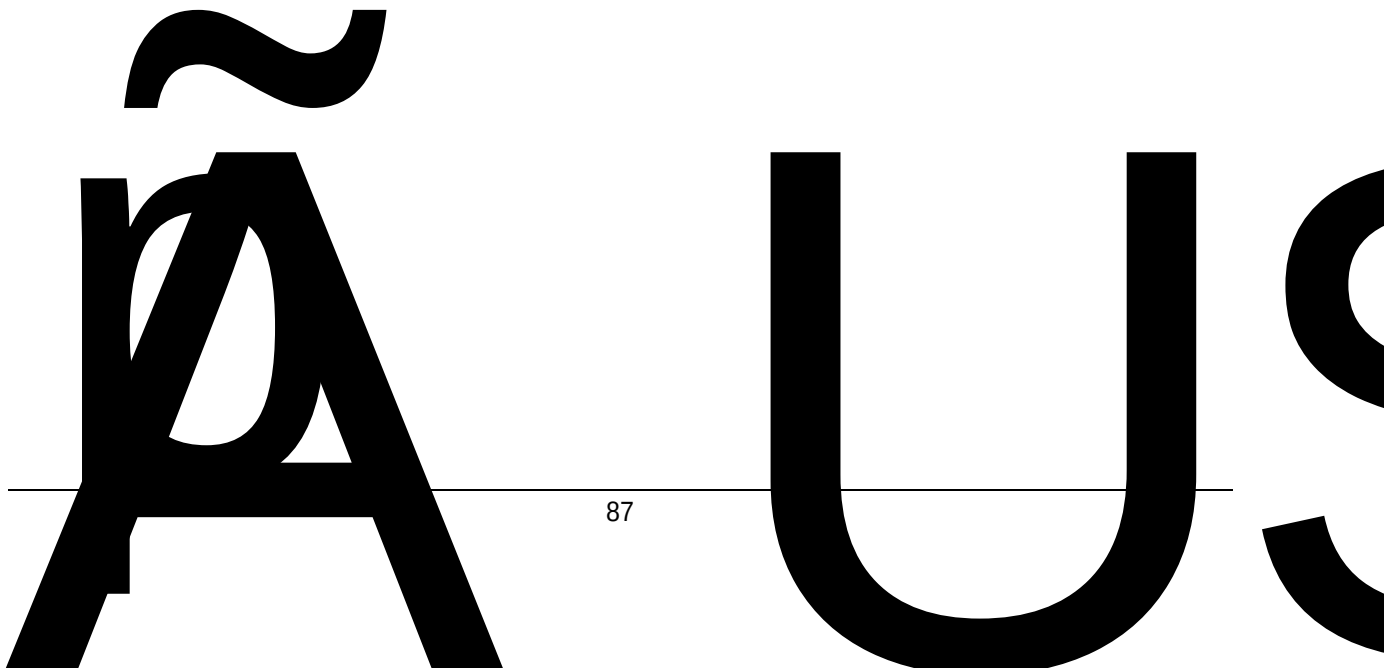

3.5.1-1

3.5.1

3.5.3

R $\frac{q}{Q}$ $\frac{q}{Q}$ $_n$ $\frac{q_n}{Q_n}$

—

… —

… —

β β … β —

α —

β

β

β

β

3.5.3-1 **β**

	β

3.5.3-2 3.5.3-1 β

		β

$$R = \alpha\left(\beta_1 \frac{q_1}{Q_1} + \beta_2 \frac{q_2}{Q_2} + \cdots + \beta_n \frac{q_n}{Q_n}\right)$$

× ×

3.6

3.6.1

3.6.2

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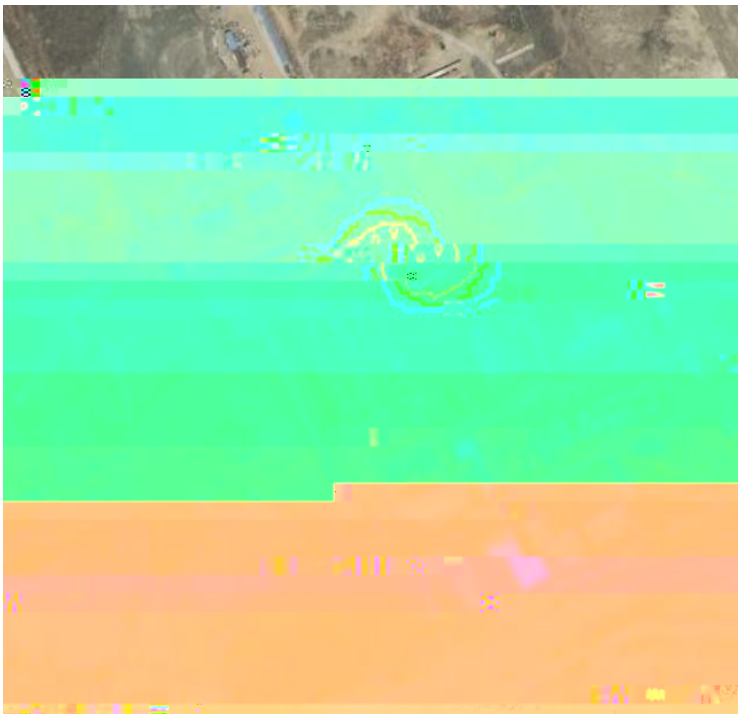

3.6.3-1

3.6.3-2

3.6.3-2

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3.6.3-1

m

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1 MTBE 0.93 5.22 10.14 1.05

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1.59 7.79 15.15 2.34

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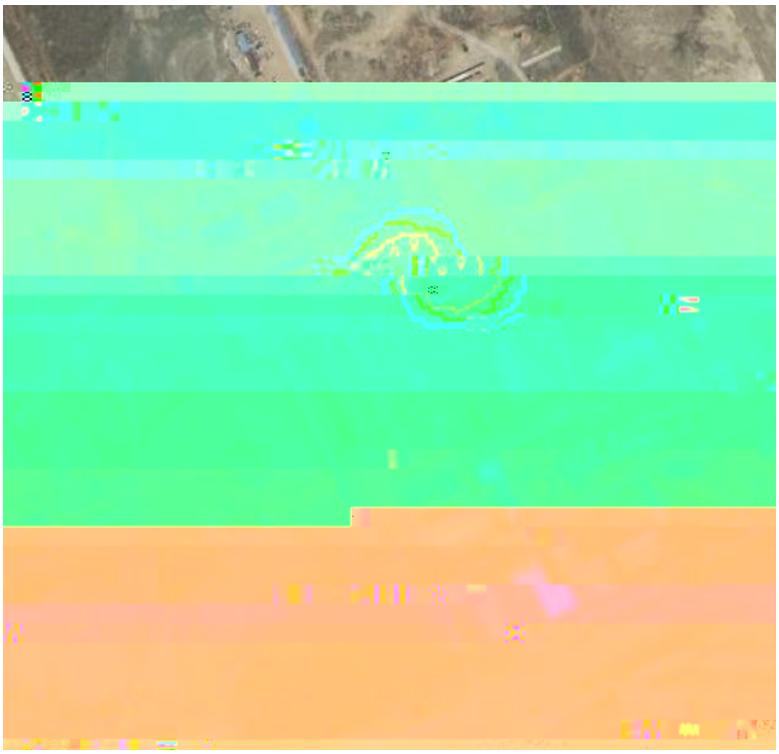
					3.59	14.33	27.87	7.92

3.6.3-3



3.6.3-3

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3.6.3-2

					m
1	MTBE	-			8.38
		-			13.04
		-			12.52
		-			13.04
2	95#	-			15.23
		-			12.43
		-			22.75
		-			12.43

					m
3	95#	-			15.23
		-			14.90
		-			22.75
		-			14.90
4		-			13.16
		-			13.04
		-			19.65
		-			13.04
5		-			13.16
		-			14.90
		-			19.65
		-			14.90
6		-			15.42
		-			14.90
		-			23.03
		-			14.90

23.03m

3.6.4

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GB36894-2018

3.6.3-1 B $<3\times10^{-5}$

$<1\times10^{-5}$

4.2-1

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4.2-1

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GB50187-2012

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GB50489-2009)

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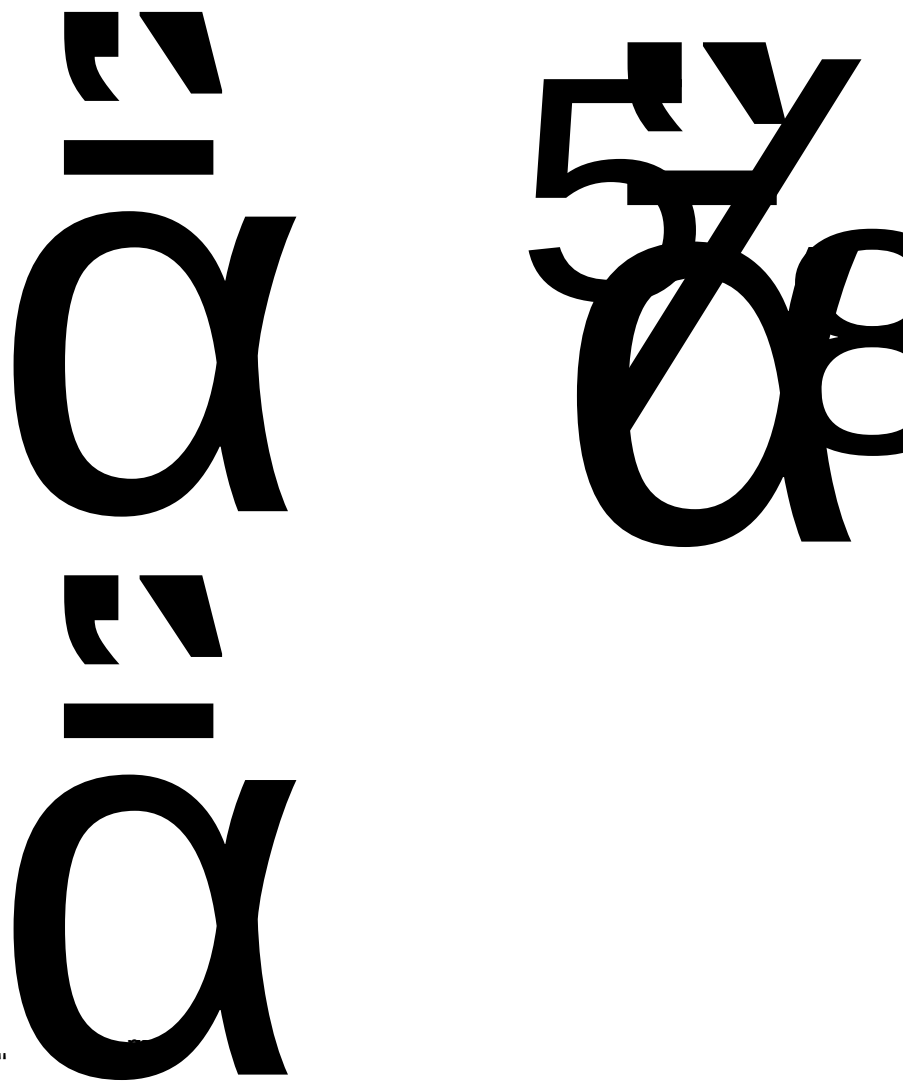

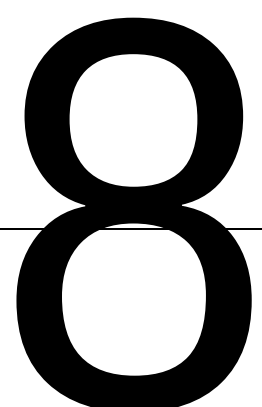

				-	177	-	-
				20	160.6	2018 GB50160-2008 4.1.9	
2	MTBE/ / /			-	76	-	-
				-	279	-	-
				40	293	2018 GB50160-2008 4.1.10	
				20	97	2018 GB50160-2008 4.1.9	
3				-	15	-	-
				-	122	-	-
				40	349	2018 GB50160-2008 4.1.10	
				20	241	2018 GB50160-2008 4.1.9	

2015 GB50160-2008

2018

GB50160-2008

m **m**

m **m**

8 ł

m **m**

m **m**

m

m

5.6
(0.4D D=14m)

5.7 2018 GB50160-2008
6.2.8

5.6
(0.4D D=14m)

5.7 2018 Ê GB50160-2008
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1. ( ) GB50160-20
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2 2018
GB50160-2008
5.1.2
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3 2018 B
GB50160-2008
5.1.3
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6	: 1. A 15m 2. B 12m 500m³ B 10m 3. A 10m 500m³ A 8m	2018 GB50160-2008 5.3.5	10.2m	
7	( ) , 3h	2018 GB50160-2008 6.1.1	( )	
8	30	2018 GB50160-2008 6.1.2		
9	: 1. 150000m² 2. ” , 48m 3. 24m 50000m	2018 GB50160-2008 6.2.1	B 2000m³	
10	B A 200m³ : 1. 5000m³	2018 GB50160-2008 6.2.2		

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1		GB50444-2008 2.2.1.6
2	2 5	2 GB50140-2005 4.0.7
3		GB50140-2005 5.1.2
4	1.50m 0.15m	GB50140-2005 5.1.3
5	,	2018

		2018 GB50160-2008		
7	1	10.0.2		
8	2	10.0.3		
9		10.0.7		
10		7.3.7		

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5.4.2-4

1	TB-01			
2	TB-02			
3	HX-06			GB/T18664
4	YM-04			
5	ZB-01			
6	ZB-02			
7	FZ-01			
8	FZ-02			
9	FZ-07			
10	FZ-09			
11	SF-01		3	
12	SF-03			
13	SF-04			
14	SF-08		4	
15	TL-01		n	
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1		1.0Mpa	1.6	2512				2023.5.18	2024.11.14
2		1.0Mpa	1.6	2955				2023.5.18	2024.11.14
3		1.0Mpa	1.6	2511				2023.5.18	2024.11.14
4		1.0Mpa	1.6	2777				2023.5.18	2024.11.14

5.4.2-6

1	A42C-25	0.70	0.75	FD2D-2023-W20-02984				2023.12.15	2024.12.14	
2	A42Y-25	0.70	0.75	FD2D-2023-W20-02985				2023.12.15	2024.12.14	
3	A42Y-25	0.70	0.75	FD2D-2023-W20-02986				2023.12.15	2024.12.14	

4	A42Y-25	0.70	0.75	FD2D-2023-W20-02987				2023.12.15	2024.12.14	
5	A42Y-25	0.70	0.75	FD2D-2023-W20-02988				2023.12.15	2024.12.14	
6	A42Y-25	0.70	0.75	FD2D-2023-W20-02989				2023.12.15	2024.12.14	

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1.4m GB50351-2014 4.2.7

4 250mm

1.4m

GB 50351-2014 4.2.7 2018 GB50160-2008

250mm

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2018 GB50160-2008 6.2.11

5 5m -

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9	5 SQJ-IA	-		
10		-		

	3 100μ m/ ≥300μm + GB4948 - - 15 108Ω 1011Ω 2 GB/T8923.1 Sa2.5 3 ≥320μm GB/T8923.1 Sa2.5 St3 80μm 90μm 80μm 250μm 2m GB/T8923.1 Sa2.5	GB/T8923.1		

	80μm 90μm 80 μm 250μm 3 CTPU 3mm CTPU			
2	b.	-		
3	c. MTBE SH/T 3022-2019 B-2 1m 1.5m 0.8m 1.5m R1208-3, B12-8, 02J331 13 28 20m SY/T0447-2014	SH/T3022-2019 SY/T0447-2014		

4	d. GB50727-2011	GB50727-2011		
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1	2018 GB50160-2008 2018 GB50016-2014	2018 GB50160-2008 2018 GB50016-2014	2018 GB50160-2008 2018 GB50016-2014 5.1.1-2	
2	2018 GB50160-2008 (GB50489-2009)	2018 GB50160-2008 (GB50489-2009)	B 67.4m 31.9m 47.7m 3152.5m2 13 ×17.7m 230.1m2	
3	2018 GB50160-2008	2018 GB50160-2008	2018 GB50160-2008 5.1.1-3	
4	GB50489-2009 2018	GB50489-2009	4	

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2 (GB/T8163-2018)

(GB/T8163-2018)

GBT12459-2017

GBT12459-2017

3 RF -

4 Sa2 1/2

2#

70% 2000KVA 1200KVA 200KVA

22KW

2#

2000KVA

1200KVA 200KVA

22KW

0.4KV

10KV

0.4KV

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3 TN-S -

	30mm		30mm	
8	A DC36V WDZN-RYJS-2x2.5 mm²	-	A WDZN-RYJS-2x2.5mm²	
9		-	MTBE IIBT1 IIAT3 IIAT3 ExdIIBT4 Gb WF2 IP65	
10	2 18m 10Ω ≤4Ω	-	4 18m 5mm 2 10Ω	
11	1.5m 30m	-	1.5m	

100Ω

50m Φ8mm 30m

6mm2

100Ω

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21		-		
22	0.5m	-	0.5m	
23		-		
24	( )	( )	( )	
25	DCS SIS GDS 1 UPS 1 UPS 1 UPS 10kVA 9kW 7495W 1505W 5 2 3 150W UPS 220VAC ± 5% 50Hz ± 0.5Hz 5% 5ms 10 2h 80% UPS UPS DCS SIS GDS 30min	-	DCS SIS GDS 1 UPS 1 UPS DCS SIS GDS 30min	

	I/O			
26	30	-		
27	40 AQ3035-2010 AQ3036-2010 30 SIS	40 AQ3035-2010 AQ3036-2010	SIS	
28	2022 52 “ ” GB/T 50493-2019	2022 52 GB/T 50493-2019		
29	1 1 I/O I/O A/D(D/A) DCS MCS DAS	-	1 1 I/O I/O A/D(D/A)	

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53		-	2.9.6.4-2	
54	(GB50116-2013)	(GB50116-2013)		
55	GB 50116-2013 6.6 60dB 15dB	GB 50116-2013 6.6		
56	1Ω SH/T 3081-2019 5.3.1	SH/T 3081-2019 5.3.1	1Ω	
57	4 SH/T 3081-2019 6.2.5	SH/T 3081-2019 6.2.5	4	
58	15m	-	15m	
59	IP65	-	IP65	

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9	(HG20571-2014) 4.6.2	(HG20571-2014) 4.6.2		
10	2m 1.05m	-	2m 1.05m	
11	( ) 1 (GB4053.1-2009) 2 (GB4053.2-2009) 3 (GB4053.3-2009)	1 (GB4053.1-2009) 2 (GB4053.2-2009) 3 (GB4053.3-2009)		
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20	GB39800.1-2020 GB 39800.2-2020 (GB/T18664-2002) (AQ/T3048-2013)	1 2	1 GB39800.1-2020 2 GB 39800.2-2020 5.4.2-4 (GB/T18664-2002) (AQ/T3048-2013)
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28	(GB/T 29639-2020)	(GB/T 29639-2020)		
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