

132 kV – 400 kV  
Dokumentation  
EDS-0102

English version is included

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## 1. Anvendelsesområde/indledning

Denne standard fastlægger kravene til indhold og layout af dokumenter, bl.a. beregninger, rapporter, tekniske tegninger og tekniske lister for Energinet El.

Denne standard er en del af et sæt af standarder, der fastlægger alle formelle krav til og retningslinjer for udarbejdelse af dokumentation og lignende.

Standarden fritager ikke leverandøren for sit ansvar for den leverede dokumentation.

### 1.1 Forkortelser og definitioner

EDS	Energinet design- og konfigurationsstandard
EGS	Energinet guideline

### 1.2 Skabeloner

#### 1.2.1 Tegningsskabeloner

Skabeloner til tegninger skal rekvireres hos Energinet.

## 2. Referencer og standarder

Dansk standard skal følges. Der henvises til:

- DS/EN ISO 16739-1:2020 IFC (Industry Foundation Classes) til datadeling i bygge- og facility managementindustrien – Del 1: Datamodel
- DS/EN 61082-1:2015 Udarbejdelse af dokumenter til elektroteknisk brug – Del 1: Regler
- DS-håndbog 117:2020 Bind 1+2 Eldokumentation. Grafiske symboler til skemaer, jf. DS/IEC 60617-DB
- DS-Handbook 166:2020 E Vejledning i RDS – Referencebetegnelsessystemer. TAG-nummerering til systemer iht. ISO/IEC 81346-serien
- EGS-0182 Quickguide til Caddy-tegner

### 3. Afhængigheder og forudsætninger

#### 3.1 Definitioner

Skal	Angiver de krav, der skal følges for at opfylde denne standard.
Bør	Angiver, at der blandt flere muligheder er én, som er særlig egnet, dog uden at nævne eller udelukke andre muligheder, eller at en bestemt fremgangsmåde foretrækkes uden nødvendigvis at være påkrævet. Andre muligheder kan anvendes efter aftale.
Kan	Angiver en fremgangsmåde, der er tilladt inden for standardens grænser.

### 4. Funktionskrav

Ikke relevant.

### 5. Designkrav

#### 5.1 Generelt

Denne standard fastlægger mindstekravene til den dokumentation, der leveres til Energinet af eksterne leverandører. Standarden er tænkt både som en kravspecifikation og en retningslinje for udarbejdelse af dokumentation.

Alle dokumenter skal have Energinet dokumentationsnummer. Nummeret skal fremgå på alle sider af dokumentet. Såfremt et dokument består af flere sider, skal sidetal og antal sider fremgå på alle sider.

Pdf'er må ikke være skrivebeskyttede eller låst med koder.

Dokumentnummeret skal være det samme som filnavnet. Dokumentnummeret skal rekvireres hos Energinet.

Filnavnet må ikke indeholde oplysninger om revisioner ved aflevering af as built.

Revisioner skal benævnes som følger:

- A, B, C, ... designfase
- 0 godkendt til konstruktion
- 1, 2, 3, ... ændringer gennemført i konstruktionsfasen og derefter

Der skal laves en overordnet dokumentliste i Excel-format, som skal indeholde kolonner til: se afsnit 5.4.1.

Hvis leverandørens tegnings- og dokumentationssoftware afviger fra nedenstående software, skal dokumenterne konverteres forud for levering af dokumentationen.

Når projekter igangsættes, skal det sikres, at al leverandørens software er konvertibelt med følgende tegnings- og dokumentationsformater:

Tegninger:	AutoCAD og/eller SEE Electrical
Rapporter/beskrivelser:	Microsoft Word
Lister:	Microsoft Excel

Al dokumentation skal desuden afleveres i originalformat.

Hvis der i projekter er udarbejdet 3D, isometrier, visualiseringer samt andre originalformater, skal disse modeller også leveres.

Leverandøren skal påvise over for Energinet, at de konverterede dokumenter er i overensstemmelse med de krav, der er fastsat i denne standard.

### 5.1.1 Sprog

Dansk eller engelsk.

### 5.1.2 Enheder

Alle enheder angives i SI-enheder.

Rørdimensioner angives i mm.

Tryk angives i Pa (kPa).

## 5.2 Rapporter

### 5.2.1 Generelt

Alle beregninger og rapporter skal opdateres til as built og fremlægges som beskrevet i denne standard. Alle beregninger eller rapporter præsenteres i et separat og hensigtsmæssigt mærket ringbind.

### 5.2.2 Format

Microsoft Word.

## 5.3 AutoCAD-tegninger

Krav til struktur for AutoCAD-tegninger kan findes i bilag A og B.

### 5.3.1 Generelt

Alle tegninger skal leveres i AutoCAD-format (.dwg) – konverteret, hvis påkrævet.

SEE Electrical kan anvendes til eldiagrammer efter aftale med Energinet, se afsnit 5.5.

### 5.3.2 Formater og rammer

Følgende tegningsformater skal anvendes i AutoCAD: A4, A3, A2, A1 og A0.

Ramme RMA4x3, RMA4x4, RMA4x5 og RMA4x6 må anvendes.

**Energinet's tegningsrammer og -hoveder skal anvendes og skal rekvireres hos Energinet.**

Tegningsrammerne indsættes i 0,0. Der må ikke tegnes uden for tegningsrammen, og tegningsrammen må under ingen omstændigheder "explode" eller "scale".

Tegningsramme og -hoved skal placeres i lag 0 og i paper space.

Limits skal fastlægges iht. målene på tegningsrammen.

Energinet Template.dwg, der angiver Energinet's krav til lag, stregtykkelse, linjetyper, farver m.v., er vist i bilag B. Lagstrukturen (.ctb-fil) skal rekvireres hos Energinet.

### 5.3.3 Målestoksforhold

Følgende metriske målestoksforhold skal som standard anvendes for tegninger: 1:1, 1:2, 1:5, 1:10, 1:20, 1:50, 1:100, 1:200, 1:500, 1:1000 og 1:2000.

### 5.3.4 Skrifttype og tekst

Standard AutoCAD-skrifttyper skal anvendes (Arial foretrækkes), se i øvrigt Bilag A.

Al tekst skal placeres i separate lag, jf. Energinet Template.dwg, se Bilag B.

### 5.3.5 Tegningshoved

Tegningshovedet skal indeholde følgende:

- Projektets titel (attribut for tekst 1) – rekvireres hos Energinet
- Tegningshoved (attribut for tekst 2 og 3)
- Tegningsnummer – rekvireres hos Energinet
- Dato (as built)
- Målestoksforhold.

Hver tegningsfil må kun indeholde ét layout. Layoutfanen skal navngives med Energinet.

### 5.3.6 Referencefiler

Alle eventuelle referencer skal ved hjælp af "Bind"-kommandoen knyttes til tegningen, når designfasen afsluttes. Alle eventuelle referencer skal være knyttet til tegningerne, når as built-dokumentationen afleveres (ved hjælp af "Bind"-kommandoen).

### 5.3.7 Skyer

Ændringer fra én revision til den næste skal angives med skyer på tegningen. Skyer fra tidligere versioner skal fjernes, når der laves en ny revision.

As built-versioner af tegninger må ikke indeholde skyer og revisionstekster.

## 5.4 Lister

### 5.4.1 Dokumentliste

Der skal laves en overordnet dokumentliste i Excel-format. Listen skal opdateres løbende i projektet og skal som minimum indeholde følgende oplysninger:

- Dokumentnummer, se afsnit 5.1
- Dokumenttitel (attribut for tekst 1, 2, 3 – fordelt på hver sin kolonne)
- Udarbejdet af (teknisk ansvarlig for dokumentet)
- Revision, se afsnit 5.1
- Revisionsdato
- Filtype (.dwg, .docx, .xlsx osv.)
- Ugyldige og slettede dokumenter.

Alle dokumenter skal tildeles et entydigt nummer, som skal rekvireres hos Energinet.

### 5.4.2 Kabelliste

Der skal udarbejdes en kabelliste i Excel-format. Skabelon til kabelliste skal rekvireres hos Energinet.

## 5.5 SEE Electrical-tegninger

### 5.5.1 Generelt

SEE Electrical V8R2 kan anvendes. SEE Electrical kvikguide skal rekvireres hos Energinet for udarbejdelse af kontrol- og beskyttelsestavler samt fordelingstavler.

### 5.5.2 Standarder/vejledning

Dansk Standard skal følges. Der henvises til:

- DS/EN 61082-1
- DS Håndbog 117 Bind 1+2
- EGS-0182

### 5.5.3 Formater og skabeloner

Skabelonen 'Energinet SFI relæfelt skabelon.sep' skal anvendes.

Det skal være muligt at udskifte alle skabelonerne uden at miste oplysninger på tegningen.

Alle sider skal være i A3-format.

Energinet's tegningsskabelon må ikke adskilles eller ændres.

#### 5.5.4 Filnavne/tegningsnummer

Filnavnet skal være det samme som tegningsnummeret. Det må ikke indeholde oplysninger om reviderede udgaver.

#### 5.5.5 Tegningshoved

Tegningshovedet skal indeholde følgende:

- Tegningsnummer (= filnavn)
- Projektbeskrivelse 1 (Projektstation)
- Projektbeskrivelse 2 (Projekttavle)
- Projekt oprettet dato (As built-dato)
- Tegnet af (Ingeniør/Teknisk tegner)
- Sideindhold (Sidebeskrivelse 1)
- Ledningsinfo (Sidebeskrivelse 2)
- Tegningsnummer, projektbeskrivelse 1 og projektbeskrivelse 2 tildeles af Energinet.

#### 5.5.6 Komponenter

Alle komponenter i tavlen skal være intelligente symboler. Det betyder, at komponenten skal indeholde leverandør, type og navn. "Typedatabasen" i SEE Electrical skal anvendes. Til kontrol- og beskyttelsestavler skal symbol- og typedatabasen rekvireres hos Energinet.

Teksten vedrørende komponenterne skal være intelligent til komponenten.

Symbolerne må ikke skaleres.

#### 5.5.7 Klemmer

Klemmetilslutninger skal være defineret korrekt iht. intern/ekstern tilslutning.

#### 5.5.8 Skrifttype og tekst

Windows standard Arial Narrow skal anvendes som standardskrifttype. Generelt skal teksten placeres, så layout og tekst kan læses. Teksten skal være 3,5 mm for at kunne læses, selv når tegningen reduceres til A4.

Tekst, der logisk hænger sammen, skal placeres som en sammenhængende tekst og må ikke bestå af flere deltekster.

#### 5.5.9 Kabler

Kablerne skal anvendes som intelligente kabler. Kabelkorenumre skal være "tændte".



#### 5.5.10 Grafiske lister

Alle lister, som er med i "Energinet SFI relæfelt skabelon.sep", skal genereres i tegningen

#### 5.5.11 Datoformat

Alle datoer skal skrives som: ÅÅÅÅ-MM-DD

#### 5.5.12 Levering af SEE Electrical-filer

Projektet skal komprimeres inden overdragelse til Energinet.

As built-versioner må ikke indeholde revisioner og revisionskyer.

## 6. Tekniske krav

Ikke relevant.

## 7. Reservedele

Ikke relevant.

## 8. Dokumentation

### 8.1 Papirkopi

Al teknisk dokumentation skal leveres til Energinet i en opdateret as built-version.

Leverandøren skal levere følgende:

- Rapporter: 1 sæt papirkopier i A4-ringbind
- Tegninger: 1 sæt papirkopier i A4-ringbind  
(tegninger udskrives i originalstørrelse og foldes til A4-format)
- Lister: 1 sæt papirkopier i A4-ringbind.

### 8.2 Elektronisk dokumentation

Alle tekniske dokumenter skal leveres til Energinet. Eget datamedie skal anvendes.

I en as built-version skal den elektroniske version svare til den trykte udgave og omvendt.

Leverandøren skal levere følgende:

- Rapporter: 1 sæt i pdf-format  
1 sæt i det oprindelige format (Word), hvis Energinet ønsker dette
- Tegninger: 1 sæt i pdf-format  
1 sæt i AutoCAD-format (SEE Electrical kan anvendes til eltegninger)
- Lister: 1 sæt i pdf-format  
1 sæt i det oprindelige format (Excel).

Hvis der i projekter er udarbejdet 3D, isometrier, visualiseringer samt andre originalformater, skal disse modeller også leveres.

Filerne må **ikke** være låste.

På Energinets opfordring skal alle check-kopier og mark-up-dokumenter udleveres, og disse dokumenter skal indeholde ændringer foretaget under design og fabrikation/konstruktion i projektforsøbet.

## 9. Bilag

### Bilag A. Opbygning af AutoCAD-tegninger og dokumenter

#### Generelle tegneregler

Tegninger skal tegnes i millimeter i model space i 1:1.

Hvis der oprettes flere views, skal der tydeligt angives målestoksforhold for de enkelte views, og "hovedtegningens" målestoksforhold skal angives i tegningshovedets felt "mål".

Eventuelle Viewport skal låses.

Tegningen må KUN indeholde det, der er gældende for tegningen.

Tegninger skal plottes fra paper space i det pågældende målestoksforhold.

Tegninger skal leveres todimensionelle. Alle linjer skal placeres i niveau 0 (z=0).

Objekter skal tegnes ved brug af passende SNAP-værdi eller object snap. Snap 2.5 skal følges for eldiagrammer.

Indsætningspunkt for tegninger skal være 0,0 i model space.

Hvis tegninger udarbejdes i det nationale koordinatsystem eller andre lokale koordinatsystemer, skal dette aftales på forhånd.

Energinet anvender UTM Euref89 til offshore-tegninger.

Energinet anvender højdesystem DVR90.

Tegningen skal vende korrekt. Det betyder eksempelvis, at en A4-tegning i portrætformat skal vises på samme måde, både i paper space og model space.

En streg må ikke bestå af flere dellinjer, og der må ikke være rester af gamle streger.

Det er ikke tilladt at placere flere identiske objekter ovenpå hinanden. Brug eventuelt kommandoen "OVERKILL".

Hvis det er nødvendigt med hjælpestreger eller -punkter, skal disse placeres i "GUIDE"-laget.

<b>Skabelon</b>	Energinet Template.dwg skal anvendes som grundlag for alle CAD-tegninger.
<b>Lagstruktur</b>	Der skal anvendes det antal lag i lagstrukturen som angivet i Bilag B, men der kan oprettes nye lag, hvis farve og streghøjde anvendes lagvis og følger Energinet Template.dwg.
<b>Objekter og blokke</b>	Blok-/cellehierarkier må ikke forekomme, dvs. blokke og celler må ikke indeholde andre blokke/celler.
<b>Standardsymboler</b>	Penopsætning for symbolerne skal være i overensstemmelse med Energinet's lagstruktur. <ul style="list-style-type: none"><li>• DS/EN 61082-1</li><li>• DS-Håndbog 117 Bind 1+2 skal følges for symbolerne.</li></ul>
<b>Dimensionering</b>	Målsætningstype, der anvendes i Energinet Template.dwg, skal bruges, se Bilag C. Dimensioneringen skal udføres lagvist i "DIM" i model space.  Dimensionering bør altid oprettes som dynamisk dimensionering og ikke annotative, medmindre der anvendes flere views.
<b>Skravering</b>	Skravering skal begrænses til det absolut nødvendige. Skraveringen skal altid placeres i separate lag, jf. lagstrukturen i Energinet Template.dwg.
<b>CAD-filer</b>	Tegningsfilernes ubrugte lag, skrifttyper, linjetyper, blokke osv. skal renses ved hjælp af "PURGE".  Grænser skal svare til tegningsformatet; tegningen skal afsluttes med "ZOOM ALL", og "UCS" skal være i "WORLD".  Tegningen skal altid gemmes i paper space.
<b>Datoformater</b>	Alle datoer skal skrives som ÅÅÅÅ-MM-DD.
<b>Programmer og versioner</b>	AutoCAD, version 2019.

## Bilag B. Lagstruktur

Lagnr.	Linjetype/brug	Stregtyk- kelse/teksthøjde	Farve på skærm	Farvenr.	Farve på print	Kommentarer
0	Continuous		White	White		
1	Continuous	0.25	Yellow	Yellow	Black	
2	Continuous	0.35	White	White	Black	
3	Continuous	0.50	Green	Green	Black	
4	Continuous	0.70	Cyan	Cyan	Black	
5	Continuous	1.00	Red	14	Black	
6	Continuous	0.18	Magenta	Magenta	Black	
7	Dashdot1	0.35	White	White	Black	Dash/dot
8	Dot	0.50	Green	Green	Black	Dot
9	Continuous	0.13	Yellow	61	Black	
10						
11	Hidden	0.25	Yellow	Yellow	Black	Dashed line
12	Hidden	0.35	White	White	Black	Dashed line
13	Hidden	0.50	Green	Green	Black	Dashed line
14	Hidden	0.70	Cyan	Cyan	Black	Dashed line
15						
16	Center/centre line	0.18	Magenta	Magenta	Black	
17	Dashdot1/Cable	0.70	Red	Red	Black	
18	Divide/Drain	0.70	Black	251	Black	
19	Phantom/Rainwater	0.70	Yellow	52	Black	
20	Hidden/Waste water	0.70	Cyan	Cyan	Black	
21	Text style 2	2.0	Yellow	Yellow	Black	Arial
	style 2-5	2.5	Yellow	Yellow	Black	Arial
22	Text style 3	3.0	White	White	Black	Arial
	style 3-5	3.5	White	White	Black	Arial
23	Text style 4-5	4.5	Green	Green	Black	Arial
	style 5	5.0	Green	Green	Black	Arial
	style A04	4.0	Green	Green	Black	Arial
24	Text style 1-25	1.25	Yellow	60	Black	Arial
	style 1-5	1.50	Yellow	60	Black	Arial
	style 1-8	1.80	Yellow	60	Black	Arial
25	Text style 2-5	2.5	White	White	Black	Arial
26	Continuous/Hatching	0.25	Cyan	132	Black	
27	Continuous/Hatching	0.35	Blue	Blue	Black	
28	Text style A02-08	2.0	Yellow	Yellow	Black	Arial (width 0.8)
	style A03-08	3.0	Yellow	Yellow	Black	Arial (width 0.8)
29	Text style 6	6.0	Green	90	Black	Arial
	style A06	6.0	Green	90	Black	Arial
	style A09	9.0	Green	90	Black	Arial
	style A12	12.0	Green	90	Black	Arial
	style A06-08	6.0	Green	90	Black	Arial (width 0.8)
30	Continuous/Pline	0.07	Red	13	Black	

Lagnr.	Linjetype/brug	Stregtyk- kelse/teksthøjde	Farve på skærm	Farvenr.	Farve på print	Kommentarer
31	Continuous/Hatching	0.18	Magenta	Magenta	Black	
32						
33						
34						
35						
36						
37						
38						
39	Continuous/ Tone down layer	0.18	Grey	8	Grey	
40						
41						
42	Frame	0.50	Green	Green	Black	Block
43	Cut marks	0.18	Magenta	Magenta	Black	Block
Defpoints				White	Black	
DIM				Yellow	Black	
Guide			Blue	150	Black	Vises ikke på print
Help			Blue	151	-	Vises ikke på print
Ident			Green	13	Black	
View			Yellow	Yellow	-	Vises ikke på print
B018	Continuous	0.18	Blue	150	Blue	
B018D	Dashdot	0.18	Blue	150	Blue	
B018H	Hidden	0.18	Blue	150	Blue	
B025	Continuous	0.25	Blue	151	Blue	
B025D	Dashdot	0.25	Blue	151	Blue	
B025H	Hidden	0.25	Blue	151	Blue	
B035	Continuous	0.35	Blue	152	Blue	
B035D	Dashdot	0.35	Blue	152	Blue	
B035H	Hidden	0.35	Blue	152	Blue	
B050	Continuous	0.50	Blue	153	Blue	
B050D	Dashdot	0.50	Blue	153	Blue	
B050H	Hidden	0.50	Blue	153	Blue	
B070	Continuous	0.70	Blue	160	Blue	
B070D	Dashdot	0.70	Blue	160	Blue	
B070H	Hidden	0.70	Blue	160	Blue	
B100	Continuous	1.00	Blue	161	Blue	
B100D	Dashdot	1.00	Blue	161	Blue	
B100H	Hidden	1.00	Blue	161	Blue	

Lagrn.	Linjetype/brug	Stregtyk- kelse/teksthøjde	Farve på skærm	Farvenr.	Farve på print	Kommentarer
C018	Continuous	0.18	Cyan	120	Cyan	
C018D	Dashdot	0.18	Cyan	120	Cyan	
C018H	Hidden	0.18	Cyan	120	Cyan	
C025	Continuous	0.25	Cyan	121	Cyan	
C025D	Dashdot	0.25	Cyan	121	Cyan	
C025H	Hidden	0.25	Cyan	121	Cyan	
C035	Continuous	0.35	Cyan	124	Cyan	
C035D	Dashdot	0.35	Cyan	124	Cyan	
C035H	Hidden	0.35	Cyan	124	Cyan	
C050	Continuous	0.50	Cyan	123	Cyan	
C050D	Dashdot	0.50	Cyan	123	Cyan	
C050H	Hidden	0.50	Cyan	123	Cyan	
C070	Continuous	0.70	Cyan	130	Cyan	
C070D	Dashdot	0.70	Cyan	130	Cyan	
C070H	Hidden	0.70	Cyan	130	Cyan	
C100	Continuous	1.00	Cyan	131	Cyan	
C100D	Dashdot	1.00	Cyan	131	Cyan	
C100H	Hidden	1.00	Cyan	131	Cyan	
G018	Continuous	0.18	Green	70	Green	
G018D	Dashdot	0.18	Green	70	Green	
G018H	Hidden	0.18	Green	70	Green	
G025	Continuous	0.25	Green	71	Green	
G025D	Dashdot	0.25	Green	71	Green	
G025H	Hidden	0.25	Green	71	Green	
G035	Continuous	0.35	Green	72	Green	
G035D	Dashdot	0.35	Green	72	Green	
G035H	Hidden	0.35	Green	72	Green	
G050	Continuous	0.50	Green	73	Green	
G050D	Dashdot	0.50	Green	73	Green	
G050H	Hidden	0.50	Green	73	Green	
G070	Continuous	0.70	Green	80	Green	
G070D	Dashdot	0.70	Green	80	Green	
G070H	Hidden	0.70	Green	80	Green	
G100	Continuous	1.00	Green	81	Green	
G100D	Dashdot	1.00	Green	81	Green	
G100H	Hidden	1.00	Green	81	Green	
L018	Continuous	0.18	Purple	183	Purple	
L018D	Dashdot	0.18	Purple	183	Purple	
L018H	Hidden	0.18	Purple	183	Purple	
L025	Continuous	0.25	Purple	193	Purple	Purple = 181

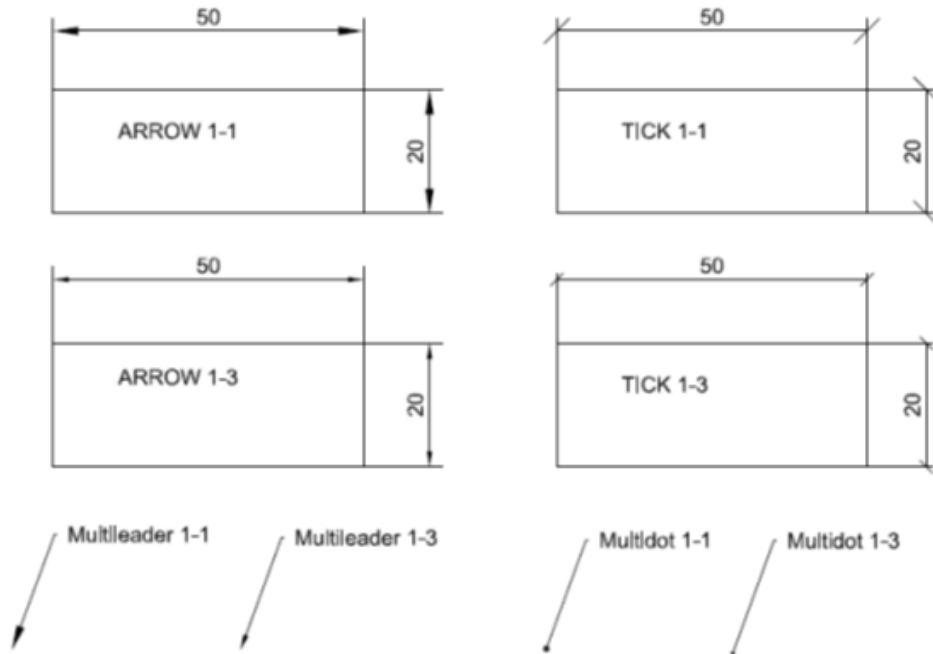
Lagrn.	Linjetype/brug	Stregtyk- kelse/teksthøjde	Farve på skærm	Farvenr.	Farve på print	Kommentarer
L025D	Dashdot	0.25	Purple	193	Purple	
L025H	Hidden	0.25	Purple	193	Purple	
L035	Continuous	0.35	Purple	191	Purple	
L035D	Dashdot	0.35	Purple	191	Purple	
L035H	Hidden	0.35	Purple	191	Purple	
L050	Continuous	0.50	Purple	190	Purple	
L050D	Dashdot	0.50	Purple	190	Purple	
L050H	Hidden	0.50	Purple	190	Purple	
L070	Continuous	0.70	Purple	181	Purple	
L070D	Dashdot	0.70	Purple	181	Purple	
L070H	Hidden	0.70	Purple	181	Purple	
L100	Continuous	1.00	Purple	195	Purple	
L100D	Dashdot	1.00	Purple	195	Purple	
L100H	Hidden	1.00	Purple	195	Purple	
M018	Continuous	0.18	Magenta	200	Magenta	
M018D	Dashdot	0.18	Magenta	200	Magenta	
M018H	Hidden	0.18	Magenta	200	Magenta	
M025	Continuous	0.25	Magenta	201	Magenta	
M025D	Dashdot	0.25	Magenta	201	Magenta	
M025H	Hidden	0.25	Magenta	201	Magenta	
M035	Continuous	0.35	Magenta	202	Magenta	
M035D	Dashdot	0.35	Magenta	202	Magenta	
M035H	Hidden	0.35	Magenta	202	Magenta	
M050	Continuous	0.50	Magenta	203	Magenta	
M050D	Dashdot	0.50	Magenta	203	Magenta	
M050H	Hidden	0.50	Magenta	203	Magenta	
M070	Continuous	0.70	Magenta	210	Magenta	
M070D	Dashdot	0.70	Magenta	210	Magenta	
M070H	Hidden	0.70	Magenta	210	Magenta	
M100	Continuous	1.00	Magenta	211	Magenta	
M100D	Dashdot	1.00	Magenta	211	Magenta	
M100H	Hidden	1.00	Magenta	211	Magenta	
P018	Continuous	0.18	Pink	222	Pink	
P018D	Dashdot	0.18	Pink	222	Pink	
P018H	Hidden	0.18	Pink	222	Pink	
P025	Continuous	0.25	Pink	221	Pink	
P025D	Dashdot	0.25	Pink	221	Pink	Pink = 230
P025H	Hidden	0.25	Pink	221	Pink	
P035	Continuous	0.35	Pink	232	Pink	
P035D	Dashdot	0.35	Pink	232	Pink	
P035H	Hidden	0.35	Pink	232	Pink	



Lagrn.	Linjetype/brug	Stregtyk- kelse/teksthøjde	Farve på skærm	Farvenr.	Farve på print	Kommentarer
P050	Continuous	0.50	Pink	230	Pink	
P050D	Dashdot	0.50	Pink	230	Pink	
P050H	Hidden	0.50	Pink	230	Pink	
P070	Continuous	0.70	Pink	223	Pink	
P070D	Dashdot	0.70	Pink	223	Pink	
P070H	Hidden	0.70	Pink	223	Pink	
P100	Continuous	1.00	Pink	231	Pink	
P100D	Dashdot	1.00	Pink	231	Pink	
P100H	Hidden	1.00	Pink	231	Pink	
R018	Continuous	0.18	Red	20	Red	
R018D	Dashdot	0.18	Red	20	Red	
R018H	Hidden	0.18	Red	20	Red	
R025	Continuous	0.25	Red	21	Red	
R025D	Dashdot	0.25	Red	21	Red	
R025H	Hidden	0.25	Red	21	Red	
R035	Continuous	0.35	Red	22	Red	
R035D	Dashdot	0.35	Red	22	Red	
R035H	Hidden	0.35	Red	22	Red	
R050	Continuous	0.50	Red	23	Red	
R050D	Dashdot	0.50	Red	23	Red	
R050H	Hidden	0.50	Red	23	Red	
R070	Continuous	0.70	Red	30	Red	
R070D	Dashdot	0.70	Red	30	Red	
R070H	Hidden	0.70	Red	30	Red	
R100	Continuous	1.00	Red	31	Red	
R100D	Dashdot	1.00	Red	31	Red	
R100H	Hidden	1.00	Red	31	Red	
Y018	Continuous	0.18	Yellow	40	Yellow	
Y018D	Dashdot	0.18	Yellow	40	Yellow	
Y018H	Hidden	0.18	Yellow	40	Yellow	
Y025	Continuous	0.25	Yellow	41	Yellow	
Y025D	Dashdot	0.25	Yellow	41	Yellow	
Y025H	Hidden	0.25	Yellow	41	Yellow	
Y035	Continuous	0.35	Yellow	42	Yellow	
Y035D	Dashdot	0.35	Yellow	42	Yellow	
Y035H	Hidden	0.35	Yellow	42	Yellow	
Y050	Continuous	0.50	Yellow	43	Yellow	
Y050D	Dashdot	0.50	Yellow	43	Yellow	
Y050H	Hidden	0.50	Yellow	43	Yellow	
Y070	Continuous	0.70	Yellow	50	Yellow	
Y070D	Dashdot	0.70	Yellow	50	Yellow	

Lagrn.	Linjetype/brug	Stregtyk- kelse/teksthøjde	Farve på skærm	Farvenr.	Farve på print	Kommentarer
Y070H	Hidden	0.70	Yellow	50	Yellow	
Y100	Continuous	1.00	Yellow	51	Yellow	
Y100D	Dashdot	1.00	Yellow	51	Yellow	
Y100H	Hidden	1.00	Yellow	51	Yellow	

Bilag C. Dimensioneringsstil



## Bilag D. Tegningsnummerforklaring i Energinet-tegninger

**XXXÆY VV ZZZ**

### XXX, stationsnummer

Stationsnummer oprettes af Energinet

### Æ, tegningstype

C = Kabellister

E = Egenforsyning

H = Bygningstegninger/Højspændingsapparater

R = Relæfelter

T = Telekommunikation/lysleder

### Y, spændingsniveau

9 = SYNCON

8 = HVDC-station

7 = Radiokædestation

5 = 400 kV-station

4 = 220 kV-station

3 = 150/132 kV-station

2 = 60/33 kV-station

1 = 10 kV-station

### VV, gruppenummer

Forskelligt, da det afhænger af tegningstype

### ZZZ, løbnummer

Fortløbende nummer

Løbnummer 000 til SEE Electrical-tegninger

### **Bilag E. Tegningsformater - leverancer til Energinet**

I forbindelse med indkøb og levering af højspændingsapparater og -anlæg skal tegningsformater leveres i ifc-format. Tegningerne skal også leveres i originalformatet.

Tegningsdokumentation for byggeri og anlæg udføres i henhold til "IKT-specifikation for byggeri og anlæg, Energinet Eltransmission".

132 kV – 400 kV  
Documentation  
EDS-0102

<b>Document title</b>		EDS-0102 Rev 1 Documentation					
<b>Document no.</b>		13/90592-246					
<b>Target group</b>		Electricity Transmission and external suppliers					
<b>Valid until</b>		1 May 2022					
Revision	Document status	Author		Reviewer		Approver	
		Name	Date	Name	Date	Name	Date
0	Replaced	DTR	23.11.2017	BEJ, JAS, PJA, ARH, SLM, JTA, FEJ, BMP, AHM, LHJ	04.12.2017	ABN	20.12.2017
1	Published	DTR	21.04.2020	BEJ, JAS, PJA, ARH, SLM, JTA, FEJ, BMP, AHM, LHJ	21.04.2020	APN	13.05.2020

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## 1. Scope/introduction

This standard provides requirements for contents and layout of documents, e.g. calculations, reports, engineering drawings and engineering lists for Energinet – Electricity.

This standard is one of a set of standards, defining all formal requirements and guidelines for the preparation of documentation and the like.

The standard does not exempt the supplier from its responsibility for the delivered documentation.

### 1.1 Abbreviations and definitions

AFC	Approved for Construction
EDS	Energinet design and configuration standard
EGS	Energinet guideline

### 1.2 Templates

#### 1.2.1 Drawing templates

Templates for drawings shall be obtained from Energinet.

## 2. References and standards

Danish Standards shall be followed. Reference is made to:

- DS/EN ISO 16739-1:2020 Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries – Part 1: Data schema (ISO 16739-1:2018)
- DS/EN 61082-1:2015 Preparation of documents used in electrotechnology – Part 1: Rules
- DS-Handbook 117:2020 Volume 1+2 Electrotechnical documentation. Graphical symbols for diagrams
- DS-Handbook 166:2020 E A Guide to RDS – Reference Designation Systems. TAG Numbers for Systems in Accordance with the ISO/IEC 81346 Standard Series
- EGS-0182 Quickguide til Caddy-tegner (in Danish only)



### 3. Dependences and conditions

#### 3.1 Definitions

Shall	Indicates the requirements strictly to be followed to conform to this standard.
Should	Indicates that among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required. Other possibilities may be applied subject to agreement.
May	Indicates a course of action permissible within the limits of the standard.

### 4. Performance requirements

Not relevant.

### 5. Design requirements

#### 5.1 General

This standard contains the minimum requirements for the documentation delivered to Energinet by external suppliers. This standard is meant as design requirements of as well as a guideline for preparation of documentation.

All documents shall be supplied with an Energinet document number. The number shall appear on all pages in the document. If a document consists of more than one page, the page number and the total number of pages shall appear on all pages.

Pdf files shall not be in read-only format or locked with codes.

The document number shall be the same as the file name and shall be ordered from Energinet.

The file name shall not contain information about revisions on submission of as-built.

Revisions shall be designated as follows:

- A, B, C, ... design phase
- 0 approved for construction (AFC)
- 1, 2, 3, ... changes during construction phase and onwards

An overall document list shall be prepared in Excel format and shall contain the columns stated in section 5.4.1.

If the supplier's drawing and documentation software deviates from the software mentioned below, the documents shall be converted prior to submission of the documentation.

When commencing design projects, it shall be ensured that the design supplier's software is convertible to the following drawing and document formats:

Drawings:	AutoCAD and/or SEE Electrical
Reports/descriptions:	Microsoft Word
Lists:	Microsoft Excel

Furthermore, all documentation shall be submitted in the original format.

If 3D, isometries, visualizations, and other original formats have been prepared for specific projects, these models shall be supplied as well.

The supplier shall demonstrate to Energinet that the converted documents are in accordance with the stipulated requirements listed in this standard.

### 5.1.1 Language

The Danish or English language shall be used.

### 5.1.2 Units

All units shall be stated in SI units.

Pipe dimensions shall be stated in mm.

Pressure shall be stated in Pa (kPa).

## 5.2 Reports

### 5.2.1 General

All calculations and reports shall be updated to 'as built' and presented as outlined in this standard. Each calculation or report shall be presented in a separate and appropriately marked binder.

### 5.2.2 Format

Microsoft Word shall be used.

## 5.3 AutoCAD drawings

Requirements for structure of AutoCAD drawings can be found in Appendix A and Appendix B.

### 5.3.1 General

All drawings shall be delivered in AutoCAD-format (.dwg) – converted, if required. SEE Electrical can be used for electrical diagrams according to agreement with Energinet, cf. section 5.5.

### 5.3.2 Formats and frames

The following drawing formats shall be used in AutoCAD: A4, A3, A2, A1, and A0.

Frames RMA4x3, RMA4x4, RMA4x5, and RMA4x6 may be used.

**Energinet drawing frames and title blocks shall be used and shall be ordered from Energinet.**

The drawing frames are inserted in 0.0. Drawings shall be made within the drawing frames, and the drawing frame must under no circumstances be exploded or scaled.

The drawing frame and title block shall be placed in layer 0 and in paper space.

Limits shall be set according to the measurements of the drawing frame.

Energinet Template.dwg, which gives the Energinet requirements for layers, line thickness, line types, colours, etc., is shown in Appendix B. The layer structure (.ctb file) shall be ordered from Energinet.

### 5.3.3 Scales

The following scales shall be used for the drawings: 1:1, 1:2, 1:5, 1:10, 1:20, 1:50, 1:100, 1:200, 1:500, 1:1000 and 1:2000.

### 5.3.4 Font and text

Standard AutoCAD fonts shall be used (Arial is preferred), see also Appendix A.

All text shall be placed in separate layers, cf. Energinet Template.dwg, see Appendix B.

### 5.3.5 Title block

The drawing title block shall contain as follows:

- Project title (attribute for text 1) – to be ordered from Energinet
- Title block (attribute for texts 2 and 3)
- Drawing number – to be ordered from Energinet
- Date (as built)
- Scale.

Each drawing file shall include only one layout. The naming of the layout tab shall include Energinet.

### 5.3.6 Reference files

All, if any, references shall be 'attached' to the drawing (by using the "Bind" command) when the design phase is completed. All, if any, references shall be 'attached' to the

drawings (by using the “Bind” command) when the as-built documentation is delivered to Energinet.

### 5.3.7 Clouds

Changes made from one revision to the next shall be indicated with clouds on the drawing. Clouds from older revisions shall be removed when updating to a new revision.

As-built versions of the drawings must not contain any clouds and revision texts.

## 5.4 Lists

### 5.4.1 Document list

An overall document list in Excel format shall be prepared. The list shall be continuously updated in the project and shall as a minimum contain the following information:

- Document number, see section 5.1
- Document title (attribute for texts 1, 2, 3 – distributed over separate columns)
- Prepared by (technician responsible for the document)
- Revision, see section 5.1
- Revision date
- File type (.dwg, .docx, .xlsx, etc.)
- Invalid and deleted documents

All documents shall have an unambiguous number which shall be ordered from Energinet.

### 5.4.2 Cable list

A cable list shall be prepared in Excel format. The cable list template shall be ordered from Energinet.

## 5.5 SEE Electrical drawings

### 5.5.1 General

SEE Electrical V8R2 can be used. SEE Electrical quick guide shall be ordered from Energinet for preparation of control and protective panels as well as switchboards.

### 5.5.2 Standards/guideline

Danish Standards shall be followed. Reference is made to:

- DS/EN 61082-1
- DS Handbook 117 Bind 1+2
- EGS-0182

### 5.5.3 Formats and templates

Template 'Energinet SFI relæfelt skabelon.sep' shall be used.

It shall be possible to replace all the templates without losing information on the drawing.

All pages shall be in A3 format.

The Energinet drawing template must not be separated or changed.

#### 5.5.4 File names/drawing number

The filename shall be the same as the drawing number. It must not contain any information regarding revised editions.

#### 5.5.5 Title block

The title block shall consist as follows:

- Drawing number ( = file name)
- Project description 1 (Project substation)
- Project description 2 (Project switchboard)
- Project creation date (As-built date)
- Designed by (Designer)
- Content of page (Page description 1)
- Wire information (Page description 2)
- Drawing number, Project description 1, and Project description 2 will be inserted by Energinet.

#### 5.5.6 Components

All components in the switchboard shall be intelligent symbols. It means that the component shall contain the supplier, type and name. The 'Type database' in SEE Electrical shall be used. For control and protective panels, the symbol and type database shall be ordered from Energinet.

The text regarding the components shall be intelligent with the component.

The symbols must not be scaled.

#### 5.5.7 Terminals

Terminal joints shall be defined correctly according to the internal/external connection.

#### 5.5.8 Font and text

Windows standard Arial Narrow shall be used as standard font. In general, the text shall be placed so that layout and text are readable. The text shall be 3.5 mm in order to be readable, even if the drawing is reduced to A4.

Text, which is logically contiguous, shall be placed as a coherent text and may not consist of several part texts.

### 5.5.9 Cables

The cables shall be applied as intelligent cables. Cable core numbers shall be 'on'.

### 5.5.10 Graphic lists

All lists included in the 'Energinet SFI relæfelt skabelon.sep' shall be generated in the drawing.

### 5.5.11 Date format

All dates shall be written: YYYY-MM-DD.

### 5.5.12 Delivery of SEE Electrical files

The project shall be compressed before handing over to Energinet.

As-built versions must not contain revisions and revision clouds.

## 6. Technical requirements

Not relevant.

## 7. Spare parts

Not relevant.

## 8. Documentation

### 8.1 Hard copy

All technical documentation shall be delivered to Energinet in an updated as-built version.

The supplier shall deliver as follows:

- Reports: 1 set of hard copies in A4 binders
- Drawings: 1 set of hard copies in A4 binders  
(drawings shall be printed in original size and folded to A4 format)
- Lists: 1 set of hard copies in A4 binders.

### 8.2 Electronic documentation

All technical documents shall be submitted to Energinet. Suitable data medium shall be used.

In an as-built version, the electronic version shall correspond to the hard copy version and the other way around.

The supplier shall deliver as follows:

- Reports: 1 set in PDF format  
1 set in the original format (Word), if required by Energinet
- Drawings: 1 set in PDF format  
1 set in AutoCAD format (SEE Electrical may be used for electrical drawings)
- Lists: 1 set in PDF format  
1 set in the original format (Excel).

If 3D, isometries, visualizations, and other original formats have been prepared for specific projects, these models shall be supplied as well.

The files must **not** be locked.

Upon the request of Energinet, all check-copies and mark-up documents shall be handed over, and such documents shall contain any design and construction changes made during the project period.

## 9. Appendices

### Appendix A. Structure of AutoCAD drawings and documents

#### General drawing rules

Drawings shall be drawn in millimetres in model space 1:1.

If more views are established, the scale for each view shall be clearly stated, and the scale of the 'main drawing' shall be stated in the field 'measure' in the title block.

Any Viewports shall be locked.

The drawing shall include ONLY what specifically applies to the drawing.

Plot shall be made from paper space in the relevant scale.

Drawings shall be delivered two-dimensionally. All lines shall be placed in level 0 (z=0).

Objects shall be drawn by using the appropriate SNAP value or object snap. Snap 2.5 shall be followed for electrical diagrams.

The insertion point for drawings shall be 0.0 in model space.

If drawings are made in the national co-ordinate system or other local grid systems, this shall be agreed in advance.

Energinet uses UTM Euref89 for offshore drawings.

Energinet uses the vertical control system DVR90.

The orientation of the drawing shall be correct. This for instance means that a drawing in A4 vertical (portrait) orientation shall appear similarly – both in paper space and model space.

A line must not consist of several part lines, and there must be no remnants of old lines.

Several identical objects must not be placed on top of each other. The command 'OVERKILL' may be used.

If auxiliary lines and points are necessary, these shall be placed in the 'GUIDE' layer.

#### Template

Energinet Template.dwg shall be used as the basis for all CAD drawings.



<b>Layer structure</b>	The number of layers in layer structure, cf. Appendix B, shall be used, but new layers may be created, if the colour and line type are 'by layer' and follow Energinet Template.dwg.
<b>Objects and blocks</b>	Block/cell hierarchies must not occur, i.e. blocks and cells must not contain other blocks/cells.
<b>Standard symbols</b>	<p>The pen setup for the symbols shall comply with Energinet's layer structure.</p> <ul style="list-style-type: none"><li>• DS/EN 61082-1</li><li>• DS-Handbook 117 Volumes 1+2 – must be followed for symbols</li></ul>
<b>Dimensioning</b>	<p>The dimensioning type applied in Energinet Template.dwg shall be used, cf. Appendix C. The dimensioning shall be in layers 'DIM' in model space.</p> <p>Dimensioning should always be created as dynamic dimensioning and should not be annotative, unless more views are applied.</p>
<b>Hatching</b>	Hatching shall be limited to what is essential. Hatching shall always be placed in separate layers, cf. layer structure in Energinet Template.dwg.
<b>CAD files</b>	<p>Drawing files shall be cleaned using 'PURGE' of unused layers, fonts, line types, blocks, etc.</p> <p>Limits shall correspond to the drawing format; the drawing shall be completed with 'ZOOM ALL', and 'UCS' shall be in 'WORLD'.</p> <p>The drawing must always be saved in paper space.</p>
<b>Date formats</b>	All dates shall be written as YYYY-MM-DD.
<b>Programs and versions</b>	AutoCAD version 2019.

## Appendix B. Layer structure

Layer no.	Line type/use	Line thickness/ text height	Colour on screen	Colour no.	Colour of plot	Comment
0	Continuous		White	White		
1	Continuous	0.25	Yellow	Yellow	Black	
2	Continuous	0.35	White	White	Black	
3	Continuous	0.50	Green	Green	Black	
4	Continuous	0.70	Cyan	Cyan	Black	
5	Continuous	1.00	Red	14	Black	
6	Continuous	0.18	Magenta	Magenta	Black	
7	Dashdot1	0.35	White	White	Black	Dash/dot
8	Dot	0.50	Green	Green	Black	Dot
9	Continuous	0.13	Yellow	61	Black	
10						
11	Hidden	0.25	Yellow	Yellow	Black	Dashed line
12	Hidden	0.35	White	White	Black	Dashed line
13	Hidden	0.50	Green	Green	Black	Dashed line
14	Hidden	0.70	Cyan	Cyan	Black	Dashed line
15						
16	Center/centre line	0.18	Magenta	Magenta	Black	
17	Dashdot1/Cable	0.70	Red	Red	Black	
18	Divide/Drain	0.70	Black	251	Black	
19	Phantom/Rainwater	0.70	Yellow	52	Black	
20	Hidden/Waste water	0.70	Cyan	Cyan	Black	
21	Text style 2	2.0	Yellow	Yellow	Black	Arial
	style 2-5	2.5	Yellow	Yellow	Black	Arial
22	Text style 3	3.0	White	White	Black	Arial
	style 3-5	3.5	White	White	Black	Arial
23	Text style 4-5	4.5	Green	Green	Black	Arial
	style 5	5.0	Green	Green	Black	Arial
	style A04	4.0	Green	Green	Black	Arial
24	Text style 1-25	1.25	Yellow	60	Black	Arial
	style 1-5	1.50	Yellow	60	Black	Arial
	style 1-8	1.80	Yellow	60	Black	Arial
25	Text style 2-5	2.5	White	White	Black	Arial
26	Continuous/Hatching	0.25	Cyan	132	Black	
27	Continuous/Hatching	0.35	Blue	Blue	Black	
28	Text style A02-08	2.0	Yellow	Yellow	Black	Arial (width 0.8)
	style A03-08	3.0	Yellow	Yellow	Black	Arial (width 0.8)
29	Text style 6	6.0	Green	90	Black	Arial
	style A06	6.0	Green	90	Black	Arial
	style A09	9.0	Green	90	Black	Arial
	style A12	12.0	Green	90	Black	Arial
	style A06-08	6.0	Green	90	Black	Arial (width 0.8)

Layer no.	Line type/use	Line thickness/ text height	Colour on screen	Colour no.	Colour of plot	Comment
30	Continuous/Pline	0.07	Red	13	Black	
31	Continuous/Hatching	0.18	Magenta	Magenta	Black	
32						
33						
34						
35						
36						
37						
38						
39	Continuous/ Tone down layer	0.18	Grey	8	Grey	
40						
41						
42	Frame	0.50	Green	Green	Black	Block
43	Cut marks	0.18	Magenta	Magenta	Black	Block
Defpoints				White	Black	
DIM				Yellow	Black	
Guide			Blue	150	Black	Not shown on plot
Help			Blue	151	-	Not shown on plot
Ident			Green	13	Black	
View			Yellow	Yellow	-	Not shown on plot
B018	Continuous	0.18	Blue	150	Blue	
B018D	Dashdot	0.18	Blue	150	Blue	
B018H	Hidden	0.18	Blue	150	Blue	
B025	Continuous	0.25	Blue	151	Blue	
B025D	Dashdot	0.25	Blue	151	Blue	
B025H	Hidden	0.25	Blue	151	Blue	
B035	Continuous	0.35	Blue	152	Blue	
B035D	Dashdot	0.35	Blue	152	Blue	
B035H	Hidden	0.35	Blue	152	Blue	
B050	Continuous	0.50	Blue	153	Blue	
B050D	Dashdot	0.50	Blue	153	Blue	
B050H	Hidden	0.50	Blue	153	Blue	
B070	Continuous	0.70	Blue	160	Blue	
B070D	Dashdot	0.70	Blue	160	Blue	
B070H	Hidden	0.70	Blue	160	Blue	
B100	Continuous	1.00	Blue	161	Blue	
B100D	Dashdot	1.00	Blue	161	Blue	

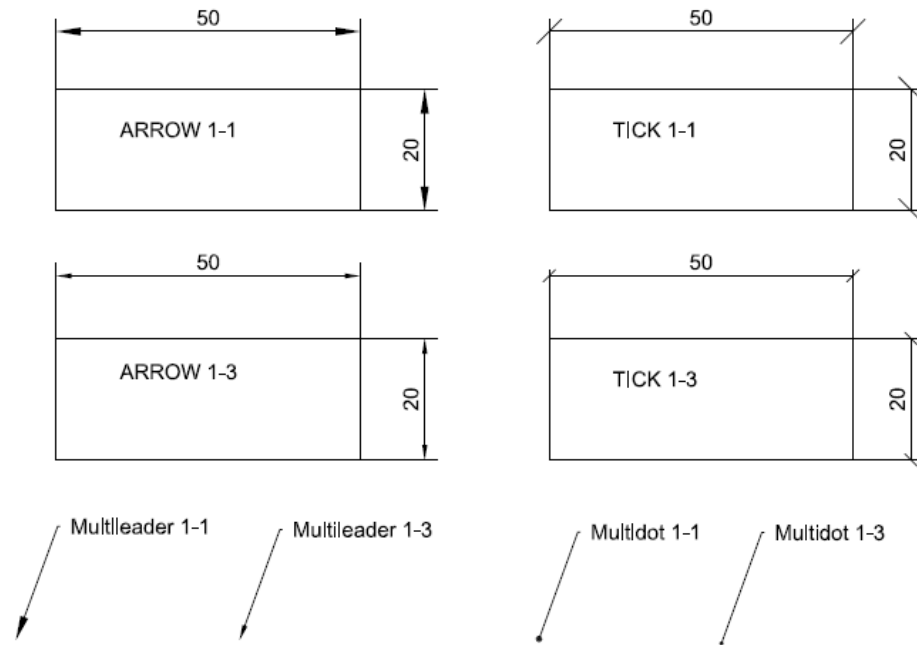
Layer no.	Line type/use	Line thickness/ text height	Colour on screen	Colour no.	Colour of plot	Comment
B100H	Hidden	1.00	Blue	161	Blue	
C018	Continuous	0.18	Cyan	120	Cyan	
C018D	Dashdot	0.18	Cyan	120	Cyan	
C018H	Hidden	0.18	Cyan	120	Cyan	
C025	Continuous	0.25	Cyan	121	Cyan	
C025D	Dashdot	0.25	Cyan	121	Cyan	
C025H	Hidden	0.25	Cyan	121	Cyan	
C035	Continuous	0.35	Cyan	124	Cyan	
C035D	Dashdot	0.35	Cyan	124	Cyan	
C035H	Hidden	0.35	Cyan	124	Cyan	
C050	Continuous	0.50	Cyan	123	Cyan	
C050D	Dashdot	0.50	Cyan	123	Cyan	
C050H	Hidden	0.50	Cyan	123	Cyan	
C070	Continuous	0.70	Cyan	130	Cyan	
C070D	Dashdot	0.70	Cyan	130	Cyan	
C070H	Hidden	0.70	Cyan	130	Cyan	
C100	Continuous	1.00	Cyan	131	Cyan	
C100D	Dashdot	1.00	Cyan	131	Cyan	
C100H	Hidden	1.00	Cyan	131	Cyan	
G018	Continuous	0.18	Green	70	Green	
G018D	Dashdot	0.18	Green	70	Green	
G018H	Hidden	0.18	Green	70	Green	
G025	Continuous	0.25	Green	71	Green	
G025D	Dashdot	0.25	Green	71	Green	
G025H	Hidden	0.25	Green	71	Green	
G035	Continuous	0.35	Green	72	Green	
G035D	Dashdot	0.35	Green	72	Green	
G035H	Hidden	0.35	Green	72	Green	
G050	Continuous	0.50	Green	73	Green	
G050D	Dashdot	0.50	Green	73	Green	
G050H	Hidden	0.50	Green	73	Green	
G070	Continuous	0.70	Green	80	Green	
G070D	Dashdot	0.70	Green	80	Green	
G070H	Hidden	0.70	Green	80	Green	
G100	Continuous	1.00	Green	81	Green	
G100D	Dashdot	1.00	Green	81	Green	
G100H	Hidden	1.00	Green	81	Green	
L018	Continuous	0.18	Purple	183	Purple	
L018D	Dashdot	0.18	Purple	183	Purple	Purple = 181
L018H	Hidden	0.18	Purple	183	Purple	

Layer no.	Line type/use	Line thickness/ text height	Colour on screen	Colour no.	Colour of plot	Comment
L025	Continuous	0.25	Purple	193	Purple	
L025D	Dashdot	0.25	Purple	193	Purple	
L025H	Hidden	0.25	Purple	193	Purple	
L035	Continuous	0.35	Purple	191	Purple	
L035D	Dashdot	0.35	Purple	191	Purple	
L035H	Hidden	0.35	Purple	191	Purple	
L050	Continuous	0.50	Purple	190	Purple	
L050D	Dashdot	0.50	Purple	190	Purple	
L050H	Hidden	0.50	Purple	190	Purple	
L070	Continuous	0.70	Purple	181	Purple	
L070D	Dashdot	0.70	Purple	181	Purple	
L070H	Hidden	0.70	Purple	181	Purple	
L100	Continuous	1.00	Purple	195	Purple	
L100D	Dashdot	1.00	Purple	195	Purple	
L100H	Hidden	1.00	Purple	195	Purple	
M018	Continuous	0.18	Magenta	200	Magenta	
M018D	Dashdot	0.18	Magenta	200	Magenta	
M018H	Hidden	0.18	Magenta	200	Magenta	
M025	Continuous	0.25	Magenta	201	Magenta	
M025D	Dashdot	0.25	Magenta	201	Magenta	
M025H	Hidden	0.25	Magenta	201	Magenta	
M035	Continuous	0.35	Magenta	202	Magenta	
M035D	Dashdot	0.35	Magenta	202	Magenta	
M035H	Hidden	0.35	Magenta	202	Magenta	
M050	Continuous	0.50	Magenta	203	Magenta	
M050D	Dashdot	0.50	Magenta	203	Magenta	
M050H	Hidden	0.50	Magenta	203	Magenta	
M070	Continuous	0.70	Magenta	210	Magenta	
M070D	Dashdot	0.70	Magenta	210	Magenta	
M070H	Hidden	0.70	Magenta	210	Magenta	
M100	Continuous	1.00	Magenta	211	Magenta	
M100D	Dashdot	1.00	Magenta	211	Magenta	
M100H	Hidden	1.00	Magenta	211	Magenta	
P018	Continuous	0.18	Pink	222	Pink	
P018D	Dashdot	0.18	Pink	222	Pink	
P018H	Hidden	0.18	Pink	222	Pink	
P025	Continuous	0.25	Pink	221	Pink	
P025D	Dashdot	0.25	Pink	221	Pink	
P025H	Hidden	0.25	Pink	221	Pink	
P035	Continuous	0.35	Pink	232	Pink	
P035D	Dashdot	0.35	Pink	232	Pink	
						Pink = 230

Layer no.	Line type/use	Line thickness/ text height	Colour on screen	Colour no.	Colour of plot	Comment
P035H	Hidden	0.35	Pink	232	Pink	
P050	Continuous	0.50	Pink	230	Pink	
P050D	Dashdot	0.50	Pink	230	Pink	
P050H	Hidden	0.50	Pink	230	Pink	
P070	Continuous	0.70	Pink	223	Pink	
P070D	Dashdot	0.70	Pink	223	Pink	
P070H	Hidden	0.70	Pink	223	Pink	
P100	Continuous	1.00	Pink	231	Pink	
P100D	Dashdot	1.00	Pink	231	Pink	
P100H	Hidden	1.00	Pink	231	Pink	
R018	Continuous	0.18	Red	20	Red	
R018D	Dashdot	0.18	Red	20	Red	
R018H	Hidden	0.18	Red	20	Red	
R025	Continuous	0.25	Red	21	Red	
R025D	Dashdot	0.25	Red	21	Red	
R025H	Hidden	0.25	Red	21	Red	
R035	Continuous	0.35	Red	22	Red	
R035D	Dashdot	0.35	Red	22	Red	
R035H	Hidden	0.35	Red	22	Red	
R050	Continuous	0.50	Red	23	Red	
R050D	Dashdot	0.50	Red	23	Red	
R050H	Hidden	0.50	Red	23	Red	
R070	Continuous	0.70	Red	30	Red	
R070D	Dashdot	0.70	Red	30	Red	
R070H	Hidden	0.70	Red	30	Red	
R100	Continuous	1.00	Red	31	Red	
R100D	Dashdot	1.00	Red	31	Red	
R100H	Hidden	1.00	Red	31	Red	
Y018	Continuous	0.18	Yellow	40	Yellow	
Y018D	Dashdot	0.18	Yellow	40	Yellow	
Y018H	Hidden	0.18	Yellow	40	Yellow	
Y025	Continuous	0.25	Yellow	41	Yellow	
Y025D	Dashdot	0.25	Yellow	41	Yellow	
Y025H	Hidden	0.25	Yellow	41	Yellow	
Y035	Continuous	0.35	Yellow	42	Yellow	
Y035D	Dashdot	0.35	Yellow	42	Yellow	
Y035H	Hidden	0.35	Yellow	42	Yellow	
Y050	Continuous	0.50	Yellow	43	Yellow	
Y050D	Dashdot	0.50	Yellow	43	Yellow	
Y050H	Hidden	0.50	Yellow	43	Yellow	
Y070	Continuous	0.70	Yellow	50	Yellow	

Layer no.	Line type/use	Line thickness/ text height	Colour on screen	Colour no.	Colour of plot	Comment
Y070D	Dashdot	0.70	Yellow	50	Yellow	
Y070H	Hidden	0.70	Yellow	50	Yellow	
Y100	Continuous	1.00	Yellow	51	Yellow	
Y100D	Dashdot	1.00	Yellow	51	Yellow	
Y100H	Hidden	1.00	Yellow	51	Yellow	

Appendix C. Dimension style





## Appendix D. Key to numbering of Energinet drawings

**XXXÆY VV ZZZ**

### **XXX, substation number**

Substation number is created by Energinet

### **Æ, drawing type**

C = Cable lists

E = Auxiliary supply

H = Building drawings/high-voltage apparatus

R = Relay fields

T = Telecommunication/optical fibre

### **Y, voltage level**

9 = SYNCON

8 = HVDC substation

7 = Radio chain station

5 = 400 kV substation

4 = 220 kV substation

3 = 150/132 kV substation

2 = 60/33 kV substation

1 = 10 kV substation

### **VV, group number**

Varies, depending on drawing type

### **ZZZ, serial number**

Consecutive numbering

Serial number 000 for SEE Electrical drawings

## **Appendix E. Drawing formats – deliveries to Energinet**

In connection with procurement and supply of switchgear and high-voltage installations the drawings shall be supplied in the ifc-format. In addition, the drawings shall be included in the original format.

Drawing documentation for building and construction shall follow instructions provided in 'IKT-specifikation for byggeri og anlæg, Energinet Eltransmission'.