Life Is On | Schneider Electric

Minera

Oil distribution transformers up to 3 150 kVA

Minera at a glance

Mineral oil-immersed, 50 Hz, three-phase distribution transformers with the following characteristics:

- Hermetically sealed with integral filling
- Cover bolted to the tank
- ONAN
- Mineral oil in accordance with IEC 60296
- Indoor / outdoor use (depending on selected fittings and options)
- Anti-corrosion surface treatment: corrositivity category class C3, “Medium” durability (according to ISO 12944-2)
- Final colour RAL 7033

Standards

These transformers comply with standards:

- EN 50588-1 (supersedes EN 50464-1:2007, EN 50541-1:2011)
- EN 60076-1
- Ecodesign regulation EU 548-2014

Overview

Standard fitting

- One 3 or 5 positions de-energized tap changer on the cover, with padlocking facility
- 3 HV porcelain bushings 250 amps (plug-in bushings available) on tank cover
- 4 LV flat bars starting from 50 kVA
- 4 LV porcelain bushings (from 50 to 3 150 kVA)
- 4 bidirectional flat rollers, lifting and untanking lugs
- 2 pulling eyes on the frame
- 2 earthing terminals on the cover
- 1 filling plug
- 1 draining device according to EN 50216-4 or DIN 42551
- 1 aluminium rating plate

Rating Plate

Minimum info that needs to be stated on the rating plate in addition to EN 60076-1 standards.

- P0, the measured no load loss at rated voltage and rated frequency, on the rated tap
- The name of the no load loss class for transformers with Sr ≤ 3 150 kVA
- Pk, the measured loss at rated current and rated frequency on the rated tap corrected to reference temperature according to EN 60076-1
- The name of the load loss class for transformers with Sr ≤ 3 150 kVA
- For dual voltage transformers, the maximum rated power at the lower voltage
- Conductor mass and the nature of the conductor
- Core mass and the nature of the core material
- For medium power pole mounted transformers, a visible display “For pole-mounted operation only”

Options

- Protection relays (DMCR® or DGPT2®) on the filling plug
- 1 free, thermometer pocket
- Control device in the thermometer pocket (pointer thermometer with 0 or 2 contacts max, 2-contact thermostat, etc.)
- 3 HV porcelain bushings 250 A (plug-in bushings available) on tank cover
- 4 LV porcelain bushings on tank cover (available from 50 kVA)
- LV, cable box IP21 or IP54
- Locking device for plug-in bushings (with or without lock)
- 3 mobile connectors for plug-in bushings – straight or elbow (cable characteristics must be specified)
- Liquid retention bund

The above options concern usual cases and are not restrictive. For additional information, please consult Schneider Electric.

Overview

Ecodesign regulation EU 548-2014

- Maximal Loss levels
- Statement on Loss tolerances:
  - No tolerance on transformer design
  - 5% tolerance for end user checks

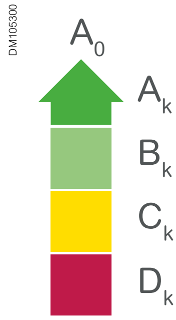
- Additional data requested on the name plates
  - Loss level and measured values
  - Type and weight of mail materials used
  - CE Marking is MANDATORY

Minera

Oil Type Transformers maximum loss levels according to Ecodesign:

- Insulation voltage MV ≤ 24 kV & LV ≤ 1.1 kV
  - A0Ck ≤ 1000 kVA
  - A0Bk > 1000 kVA

- Insulation voltage: MV ≤ 36 kV & LV ≤ 1.1 kV
  - A0 +15% Ck +10% ≤ 1000 kVA
  - A0 +15% Bk +10% > 1000 kVA



Minera up to 24 kV

A0Ak

Electrical characteristics

Power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500
Primary voltage (V)	20000														
Isolation level (kV)	up to 24														
Secondary voltage (V)	400														
HV tapping range (%)	±2x2,5														
Vector group	Dyn														
No-load losses (W)	90	145	210	250	300	360	430	510	600	650	770	950	1200	1450	1750
Load losses at 75°C (W)	875	1475	2000	2350	2750	3250	3850	4600	5400	7000	9000	11000	14000	18000	22000
Impedance voltage (%)	4														
HV bushings acc.DIN (porcelain)	DT 20/30														
LV bushings acc.DIN (porcelain)	DT 250	DT 250	DT 400	DT 630	DT 630	DT 630	DT 630	DT 1000	DT 1000	DT 2000	DT 2000	DT 3150	DT 3150	DT 3150	DT 3150
Max. altitude (m)	1000														
Max ambient temperature (°C)	40														
MV/LV windings material	Al/Al														

Minera up to 24 kV

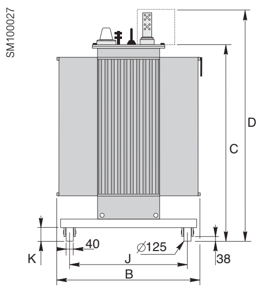
AoAk

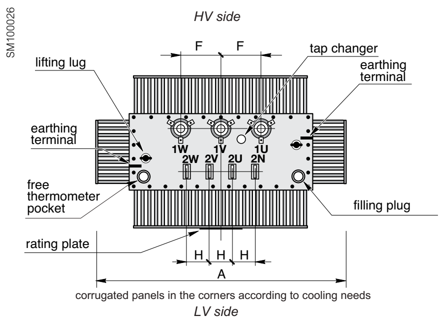
Dimensions and weights

Bushings are marked according to IEC standard.

D: Height over LV cable box (optional accessory, compatible with HV plug-in bushings only).

Dimensions and weights are for guidance only.





Dimensions

Rated power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500
Lenght A	1080	1080	1160	1180	1210	1260	1250	1320	1350	1600	1580	1810	2010	2180	2390
Width B	740	740	760	760	780	800	800	930	930	990	1080	1080	1180	1350	1350
Height on cover C	695	775	715	1025	855	1135	1005	1275	1275	1295	1445	1445	1595	1805	1967
Height on bushings D	1080	1160	1100	1410	1240	1520	1390	1660	1620	1680	1830	1830	1980	2190	2420
Distance between HV bushings F	265	265	265	265	265	265	265	265	265	265	265	265	265	265	265
Distance between HV bushings H	150	150	150	150	150	150	150	150	150	150	150	150	165	165	220
Roller distance J	520	520	520	520	520	670	670	670	670	670	820	820	820	1070	1070
Roller diam I	125	125	125	125	125	125	125	125	125	125	160	160	160	200	200
Roller K	92.5	92.5	92.5	92.5	92.5	92.5	92.5	92.5	92.5	92.5	117	117	117	140	140

Weight (kg)

Rated power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500
Total weight	580	740	1000	1090	1190	1430	1600	1880	2110	2520	3030	3170	3890	4800	5670
Oil weight	198	192	195	231	252	290	315	376	398	501	601	611	670	895	1060

Minera up to 24 kV

A0Bk

Electrical characteristics

Power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Primary voltage (V)	20000															
Isolation level (kV)	up to 24															
Secondary voltage (V)	400															
HV tapping range (%)	±2x2,5															
Vector group	Dyn															
No-load losses (W)	90	145	210	250	300	360	430	510	600	650	770	950	1200	1450	1750	2200
Load losses at 75°C (W)	875	1475	2000	2350	2750	3250	3850	4600	5400	7000	9000	11000	14000	18000	22000	27500
Impedance voltage (%)	4									6						
HV bushings acc.DIN (porcelain)	DT 20/30															
LV bushings acc.DIN (porcelain)	DT 250	DT 250	DT 400	DT 630	DT 630	DT 630	DT 630	DT 1000	DT 1000	DT 2000	DT 2000	DT 2000	DT 3150	DT 3150	DT 3/4500	DT 1/5000
Max. altitude (m)	1000															
Max ambient temperature (°C)	40															
MV/LV windings material	Al/Al															

Minera up to 24 kV

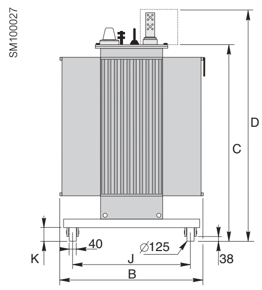
A0Bk

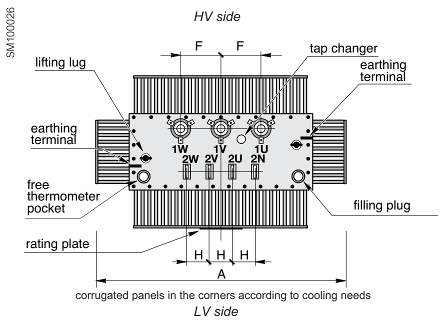
Dimensions and weights

Bushings are marked according to IEC standard.

D: Height over LV cable box (optional accessory, compatible with HV plug-in bushings only).

Dimensions and weights are for guidance only.





Dimensions

Rated power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Lenght A	1080	1080	1160	1180	1210	1260	1250	1320	1350	1600	1580	1810	2010	2180	2390	2350
Width B	740	740	760	760	780	800	800	930	930	990	1080	1080	1180	1350	1350	1310
Height on cover C	695	775	715	1025	855	1135	1005	1275	1275	1295	1445	1445	1595	1805	1967	1780
Height on bushings D	1080	1160	1100	1410	1240	1520	1390	1660	1620	1680	1830	1830	1980	2190	2420	2500
Distance between HV bushings F	265	265	265	265	265	265	265	265	265	265	265	265	265	265	265	265
Distance between HV bushings H	150	150	150	150	150	150	150	150	150	150	150	150	165	165	220	220
Roller distance J	520	520	520	520	520	670	670	670	670	670	820	820	820	1070	1070	1070
Roller diam I	125	125	125	125	125	125	125	125	125	125	160	160	160	200	200	200
Roller K	40	40	40	40	40	40	40	40	40	40	50	50	50	70	70	70
Sound power level L_{WA}	39	41	44	46	47	49	50	51	52	53	55	56	58	60	63	64

Weight (kg)

Rated power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Total weight	580	740	1000	1090	1190	1430	1600	1880	2110	2520	3030	3170	3890	4800	5670	6520
Oil weight	190	185	195	231	252	290	315	376	398	501	601	611	670	895	1060	1190
Conductor weight	60	84	107	124	146	148	191	210	299	411	425	443	575	607	618	868
Core weight	154	277	452	441	500	624	718	820	922	912	1068	1138	1412	1720	2153	2356

Minera up to 24 kV

A0Ck

Electrical characteristics

Power (kVA)	50	100	160	200	250	315	400	500	630	800	1000
Primary voltage (V)	20000										
Secondary voltage (V)	up to 24										
Isolation level (kV)	420										
HV tapping range (%)	±2x2,5										
Vector group	Dyn5										
No-load losses (W)	90	145	210	250	300	360	430	510	600	650	770
Load losses at 75°C (W)	1100	1750	2350	2750	3250	3900	4600	5500	6500	8400	10500
Impedance voltage (%)	4										
HV bushings acc.DIN (porcelain)	DT 20/30										
LV bushings acc.DIN (porcelain)	DT 250	DT 250	DT 400	DT 630	DT 630	DT 630	DT 630	DT 1000	DT 1000	DT 2000	DT 2000
Max. altitude (m)	1000										
Max ambient temperature (°C)	40										
MV/LV windings material	Al/Al										

Minera up to 24 kV

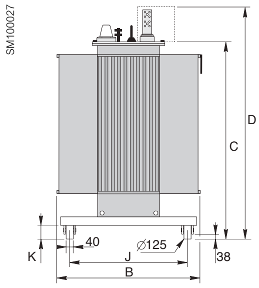
AoCk

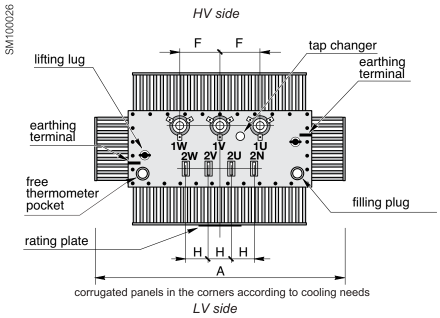
Dimensions and weights

Bushings are marked according to IEC standard.

D: Height over LV cable box (optional accessory, compatible with HV plug-in bushings only).

Dimensions and weights are for guidance only.





Dimensions

Rated power (kVA)	50	100	160	200	250	315	400	500	630	800	1000
Lenght A	870	980	1110	1130	1120	1170	1230	1250	1460	1770	1880
Width B	740	740	740	740	780	910	930	990	10100	1030	1160
Height on cover C	925	965	1005	1045	1025	1045	1025	1235	1275	1295	1485
Height on bushings D	1310	1350	1390	1430	1410	1430	1410	1620	1660	1680	1870
Distance between HV bushings F	265	265	265	265	265	265	265	265	265	265	265
Distance between HV bushings H	150	150	150	150	150	150	150	150	150	150	150
Roller distance J	520	520	520	520	520	670	670	670	670	670	820
Roller diam I	125	125	125	125	125	125	125	125	125	125	160
Roller K	92.5	92.5	92.5	92.5	92.5	92.5	92.5	92.5	92.5	92.5	117

Weight (kg)

Rated power (kVA)	50	100	160	200	250	315	400	500	630	800	1000
Total weight	460	650	940	1030	1020	1230	1360	1710	1970	2270	2990
Oil weight	111	150	206	220	218	241	260	337	397	455	565

Minera up to 36 kV

Electrical characteristics

	up to 36kV AoCk											up to 36kV AoBk				
Power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Primary voltage (V)	35000															
Isolation level (kV)	400															
Secondary voltage (V)	up to 36															
HV tapping range (%)	±2x2,5															
Vector group	Dyn5															
No-load losses (W)	103	166	241	287	345	414	494	586	690	747	885	1092	1380	1667	2012	2530
Load losses at 75°C (W)	1210	1925	2585	3025	3575	4290	5060	6050	7150	9240	11550	12100	15400	19800	24200	30250
Impedance voltage (%)	4							6								
HV bushings acc.DIN (porcelain)	DT 40/30															
LV bushings acc.DIN (porcelain)	DT 250	DT 250	DT 250	DT 630	DT 630	DT 630	DT 630	DT 1000	DT 1000	DT 2000	DT 2000	DT 2000	DT 3150	DT 3150	DT 3/4500	DT 1/5000
Max. altitude (m)	1000															
Max ambient temperature (°C)	40															
MV/LV windings material	Cu/ Cu	Cu/ Al	Al/ Al													

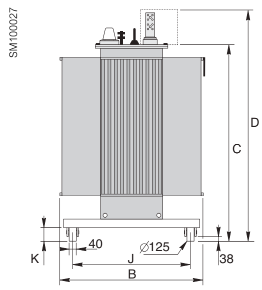
Minera up to 36 kV

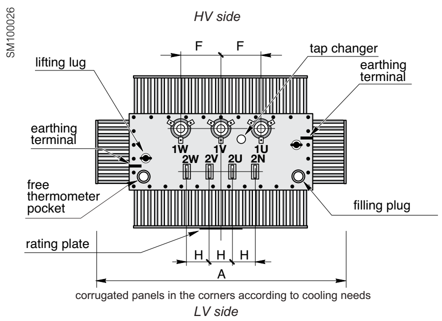
Dimensions and weights

Bushings are marked according to IEC standard.

D: Height over LV cable box (optional accessory, compatible with HV plug-in bushings only).

Dimensions and weights are for guidance only.





Dimensions

Rated power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Lenght A	1090	1150	1240	1240	1280	1280	1330	1310	1410	1520	1680	1740	1970	2390	2480	2680
Width B	740	480	800	790	820	810	840	1010	910	1030	1100	1050	1120	1390	1370	1500
Height on cover C	1150	1130	1260	1310	1340	1330	1430	1510	1570	1550	1680	1930	1950	2080	2270	2370
Height on bushings D	1640	1620	1750	1800	1830	1820	1920	2000	2060	2040	2170	2420	2440	2570	2760	2860
Distance between HV bushings F	265	265	265	265	265	265	265	265	265	265	265	265	265	265	265	265
Distance between HV bushings H	150	150	150	150	150	150	150	150	150	150	150	150	165	165	220	220
Roller distance J	520	520	520	520	520	670	670	670	670	670	820	820	820	1070	1070	1070
Roller diam I	125	125	125	125	125	125	125	125	125	125	160	160	160	160	200	200
Roller K	40	40	40	40	40	40	40	40	40	40	50	50	50	50	70	70
Sound power level L_{WA}	40	29	35	36	40	43	44	50	47	50	51	51	56	60	58	48

Weight (kg)

Rated power (kVA)	50	100	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Total weight	660	1080	1280	1430	1480	1620	1920	2170	2480	2830	3230	3970	4300	2160	6630	8940
Oil weight	215	251	340	375	379	392	465	540	572	666	722	949	996	1116	1409	2005
Conductor weight	69	92	78	95	97	130	137	168	199	273	303	376	447	506	577	672
Core weight	167	439	537	603	640	689	791	814	1041	1027	1155	1491	1601	1737	2337	3462

Note: AoCk up to 1000 kVA and AoBk between 1000 kVA and 3150 kVA.

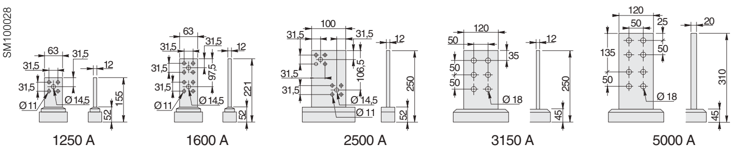
Minera up to 24 kV

Terminations

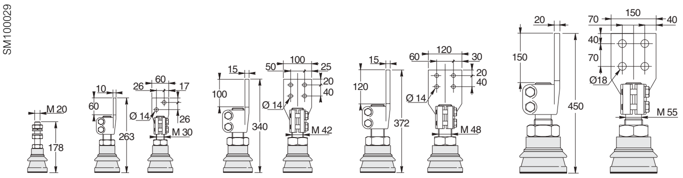
Rated current (A)

LV flat-bars	On request			1250	1250	1250	1250	1250	1250	1250	1600	2500	2500	3150	5000
LV porcelain bushings	250	250	250	630	630	630	1000	1000	1000	2000	2000	2000	3150	3150	4500

LV Terminations

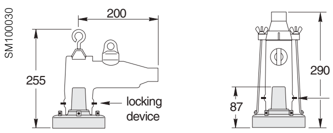


LV bus-bars terminations - EN 50387 (standard from 250 kVA)

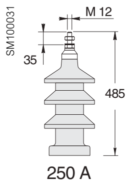


LV porcelain bushings - EN 50386
(standard from 50 to 160 kVA – option for other powers)

HV Terminations - EN 50180



HV plug-in bushings 250 A/24 kV (standard).



HV porcelain bushing 250 A (option)

eco design

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