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SANIL

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SANIL

TRANSFORMER

PRODUCT GUIDE


SANIL
SANIL

전세계가 신뢰하는 SANIL

SANIL is one of leading manufacturer of Distribution and Power Transformers in Korea Was established in 1987 and has long experience in design, evaluation and manufacturing of all types of distribution and Power Transformers and as well as special transformers, according to the international standard.

SANIL is doing utmost efforts in manufacturing new generations of Power Transformers through up to dated technology, highly reliable manufacturing facilities and skillful manpower.

SANIL is to support you and to add value to your activities, by offering a comprehensive range of top quality transformers.

We also provide top class service and support.

Contents

산일전기는 편리하고, 안전한 제품으로
고객과 함께 미래를 향해 뛰고 있습니다.
SANIL goes at a run for future together
with clients with its convenient and
safty products.

SANIL Technology

SANIL transformers are designed in accordance with the international standards to provide reliable and economical service for a wide variety of utility and industrial applications. Designs take full advantage of improved core, Coil and insulation materials, new manufacturing techniques and processes, and the latest advances in transformer technology.

산일 변압기는 산업 전반에 안전하고 경제적으로 사용할 수 있도록 앞선 기술력을 바탕으로 최신의 제조설비와 품질경영으로 국제규격(IEC) 및 고객의 요구에 잘 부합하도록 생산합니다.

SANIL supplies the all kind of Power & Distribution transformers including specific design for pole-mounted, pad-mounted, power-centers and substation, and for single and three phase transformers range from 5kVA to 30MVA, with primary voltage up to 72.5kV.

산일 변압기는 단상 혹은 삼상의 용량 30MVA 와 일차전압 72.5kV까지 생산이 가능하며, 고객이 원하는 특수용도(정류기용, 선박용, 고조파 필터용 등) 의 다양한 제품을 생산 공급합니다.

SANIL transformers are manufactured in accordance with the international quality standard ISO 9001 and ISO 14001.

산일 변압기는 ISO 9001 과 ISO 14001 의 관리 시스템에 의해 최고의 제품을 친환경적으로 생산하고 있습니다.

Product range

Product	Capacity	Primary Voltage	Features
Power Transformers	Upto 50MVA	Upto 69kV	Used for indoor or outdoor applications, can be provided with on-load or off load tap changer.
Distribution Transformers	Upto 10MVA	Upto 69kV	Used for indoor or outdoor applications, can be provided with on-load or off load tap changer.
Pole mounted Transformers	Upto 333kVA	Upto 33kV	Used for pole mounted, can be provided with off load tap changer
Pad mounted Transformers	Upto 3MVA	Upto 33kV	Used for pad mounted, cab be provided with Radial or Loop feed system and Live front or Dead front construction

Standards

- KS (Korea Standard)
- ANSI (American National Standard Institution)
- BSI (British Standard Institution)
- IEC (International Electrotechnical Commission)
- NEMA (National Electrical Manufacturers Association)
- JEC (Japanese Electrical Committee)

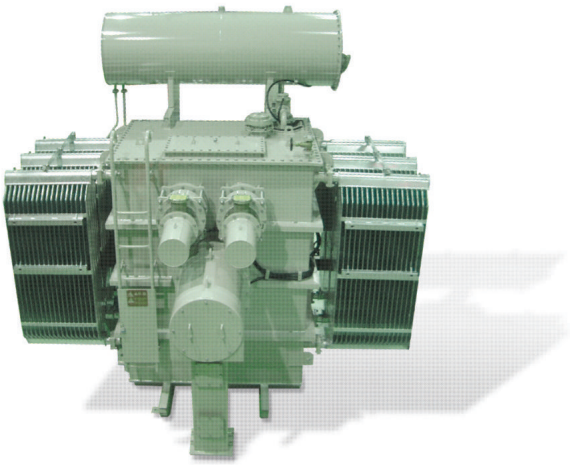
Power Transformers

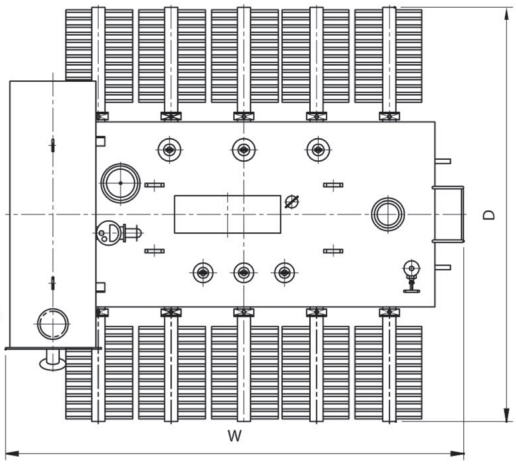
We menufacture a range of either oil or synthetic liquid filled transformers up to 50MVA at voltage 69KV.
Tappings are provided on the H.V. winding, controlled either by means of an off-circuit tap changer, or on-load tap changer.

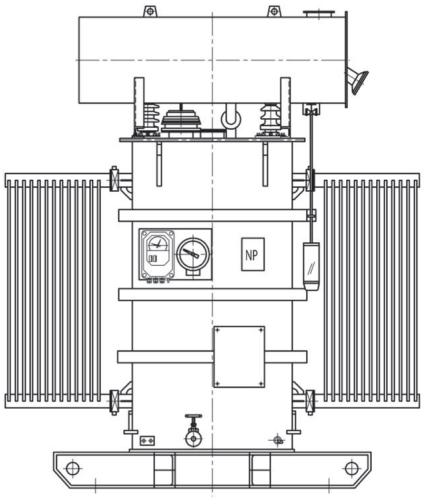
송변전 계통 및 산업시설의 대전력 수용가에게 필요한 대용량 변압기 입니다.
당사에서 생산하는 산업시설의 전력용 변압기의 용량은 50MVA, 최고전압은 69KV 급까지 범위이며, 탭조정은 무전압 탭절환방식 또는 부하시 탭 절환방식을 고객의 요구에 맞추어 제작합니다.

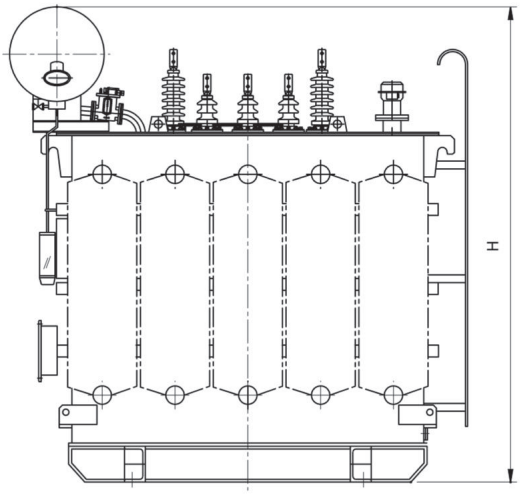
Product range

- Single or Three phase transformers
- HVDC Converter transformers
- Phase-shifting transformers
- Auto transformers
- Substation transformers with cable boxes
- etc.









Dimension & Weight

Voltage		Capacity (kVA)	Dimension(mm)			Oil (ℓ)	Weight (Kg)
Primary	Secondary		W	D	H		
22.9 kV	6.6/3.3 kV	1500	1800	1750	1800	1250	4500
		2000	1900	1800	1850	1350	5100
		3000	2200	2000	1600	1750	7000
		5000	1650	1500	3200	3000	12000
		7500	2900	1800	3400	4000	14500
		10000	3200	3400	3500	5500	19000
		12000	3300	3600	3600	6200	24000
		15000	3600	3800	3800	7500	36000
		20000	3600	4200	4000	8000	30000
		30000	4000	4600	4200	10000	40000
		40000	4500	4800	4400	11500	54000
		50000	4800	4900	4500	12000	65000

※ 상기의 Data는 참고치이며, 상세사양에 따라 변경될 수 있습니다.

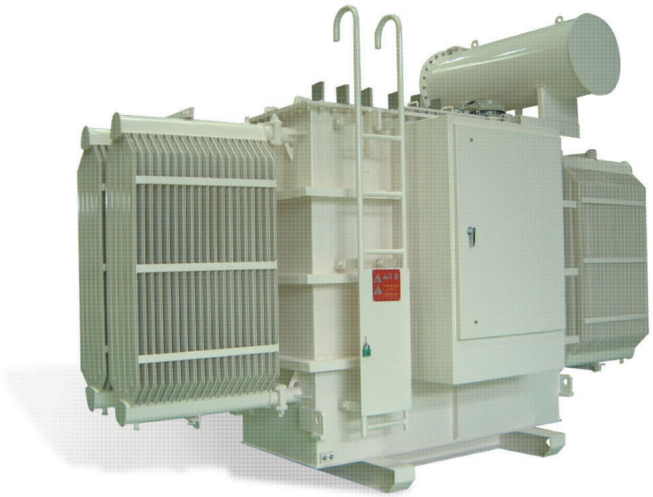
Distribution Transformers

Sanil distributions range upto 10MVA with primary voltage upto 34.5kV has been manufactured for over 20years and are used in mainly industrial applications and special purpose applications to fulfill the customers requirements.
The windings of the transformers are made of high grade electrolytic copper or aluminum. The high voltage windings are wound either with round, enamel insulated, or shaped, paper insulated wire. The low voltage windings are wound with shaped, paper insulated wire or foil. The winding construction is characterized by high dielectric strength with high resistance, to atmospheric surges and to the effects of short-circuits.

산일 배전용 변압기는 끊임없는 연구개발과 독자적인 최적의 설계기법을 적용하며, 자동화된 최신의 설비로 저소음 저손실화 및 Slim화를 실현하여, 설치가 용이하고 전력손실 및 운전경비를 대폭 절감시킨 에너지 절약형 제품입니다.

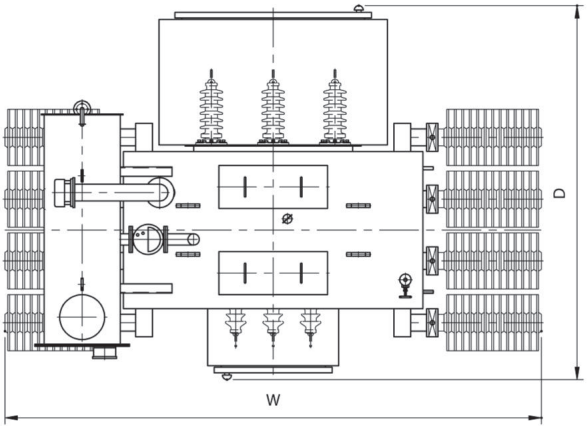
Open Breather type transformer

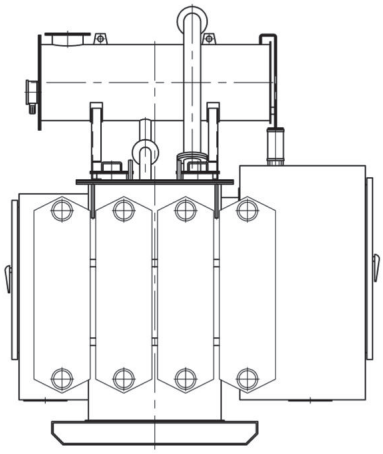
Special transformer

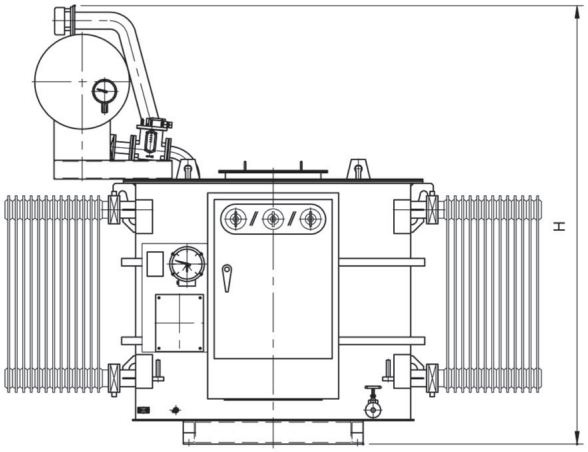


Conservater type transformer

sealed type transformer







Dimension & Weight

Three phase 22900V-L.V

Capacity (kVA)	Dimension(mm)			Oil (ℓ)	Weight (Kg)
	W	D	H		
100	1200	1550	1150	250	700
200	1250	1580	1200	300	950
300	1400	1600	1250	350	1100
400	1650	1750	1350	410	1500
500	1850	1800	1400	520	2000
600	1900	1800	1400	580	2100
750	2100	1850	1450	650	2300
1000	2500	2000	1500	870	3200
1500	2700	2100	1600	1150	3500
2000	2850	2150	2500	1580	5550
2500	3100	2250	2600	1800	7000

※ 상기의 Data는 참고치이며, 상세사양에 따라 변경될 수 있습니다.

Three phase 22900V-6600/3300V

Capacity (kVA)	Dimension(mm)			Oil (ℓ)	Weight (Kg)
	W	D	H		
300	1600	1900	1200	330	1500
500	2000	1950	1400	550	2050
750	2100	2000	1500	750	2800
1000	2300	2050	1650	900	3400
1500	2600	2100	2300	1400	4950
2000	2750	2150	2500	1450	5800
2500	2900	2200	2600	1500	6300
3000	3050	2250	2650	1550	6550
4000	3200	2300	2900	1700	7000
5000	3700	2300	3000	2300	9800
6000	4100	2400	3100	2460	11200

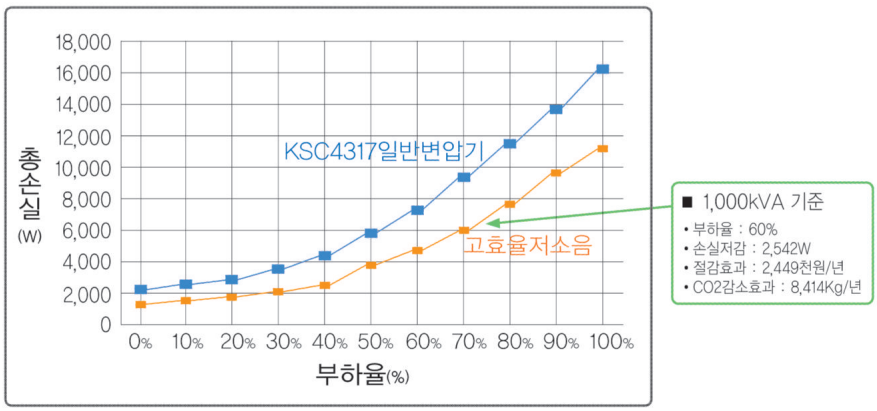
High efficiency Transformers
(고효율 저소음 유입 변압기)

The world wide energy saving potential of switching to high efficiency transformers is not only technically advantageous, but also bring economic and environmental benefits.
Sanil transformers will continues to be improved as needed to make it possible to reduce energy consumption and noise. The no-load losses and noise can be reduced by selecting a high performance steel for the core which is high permeability grain oriented steels and / or refine the domains of the iron crystals by laser etching.
The joints of the magnetic circuit between the leg and yoke are mitred at 45° and interleaved and clamped down in order to reduce vibrations and minimize noise levels with special care of manufacture technology.

신제품인 고효율 저소음 변압기는 방향성 자구미세화 전기강판을 사용하였으며, 철심절단 방법 및 권선 구조를 혁신적으로 개선하여 무부하손실 및 부하손실을 기존 변압기 대비 약 30%이상을 감소시켜 저소음, 고효율화를 실현하므로서 지구 온난화의 주범인 CO_2의 배출량을 현격히 감소시킬 수 있습니다.

고효율 저소음 변압기의 특징

- 저손실 : KSC 4317 규격 대비, 전손실을 30~40% 저손실화 실현.
- 저소음 : KSC 4317(NEMA)규격 대비 4~6dB이상 저소음화 실현.
- 환경친화성 : 고효율 저소음화로 지구온난화의 주범인 CO_2 배출량을 현격히 감소시킴.
- 전력요금 절감 : 부하율에 따라 30%~40%이상의 전력요금 절감.



● 년간 전력요금 비교

전력요금 = 전손실(kW) x 24(시간) x 365(일) x KWH당 전력요금(원/KWh)

계산예)
3상 1000kVA : 고효율 저소음 변압기
전손실 = 4.778(KW), 부하율 60%시
년간전력요금 = 4.778(KW) x 24(h) x 365(일) x 110(원/KWh) = 4,604천원/년

3상 1000kVA : KSC 4317 일반 변압기
년손실 = 7.319(KW), 부하율 60%시
년간전력요금 = 7.319(KW) x 24(h) x 365(일) x 110(원/KWh) = 7,052.5천원/년

● 년간 CO_2 배출량 비교

계산식 = 전손실(kW) x 24(시간) x 365(일) x 전력 수전단 CO_2 배출계수(Kg/KWh)

계산예)
3상 1000kVA : 고효율 저소음 변압기
전손실 = 4.778(KW), 부하율 60%시
년간전력요금 = 4.778(KW) x 24(h) x 365(일) x 0.378(Kg/KWh) = 15,821Kg/년

3상 1000kVA : KSC 4317 일반 변압기
년손실 = 7.319(KW), 부하율 60%시
년간전력요금 = 7.319(KW) x 24(h) x 365(일) x 0.378(Kg/KWh) = 24,235.2Kg/년

변압기의 손실특성과 등가 부하율

● 변압기의 손실특성

변압기가 운전중에 발생하는 손실로 전손실(Wt)은 무부하손실(Wi)과 부하손실(Wc)로 구분 합니다.

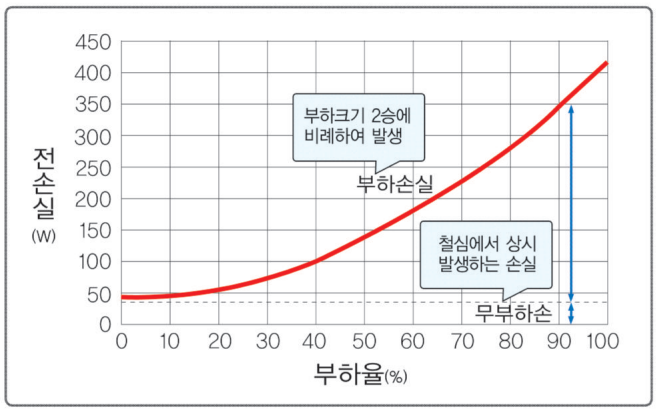
〈 전손실〉

$$Wt = Wi + (P/100)^2 \times Wc \qquad P = \text{부하율}(\%)$$

무부하손실(Wi)… 철심에서 발생하는 손실로 히스테리손 및 eddy current losses의 형태로 발생되어지며 부하유무에 상관없이 전압이 가압된 상태라면 24시간 연속 발생되어지는 손실로 사용 철심(Core)의 재질특성에 따라 그손실 크기가 결정됩니다.

부하손실(Wc)…변압기의 부하율에 따라 달라지며 부하율의 자승에 비례하여 발생 됩니다.

(그림 1. 부하율과 손실의 관계)



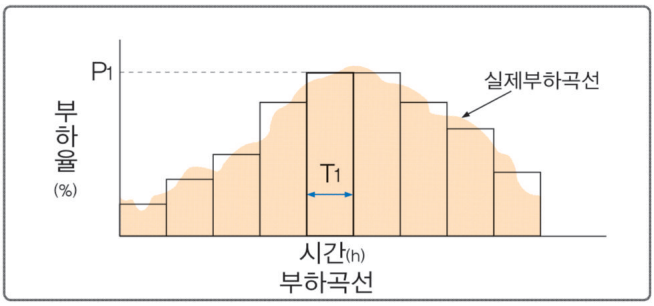
전손실의 크기는 부하율에 따라다름.

● 등가 부하율

실제 변압기의 부하변동은 복잡하기 때문에 (그림2)에 나타낸것처럼 부하율을 계단형태의 근사하게 등가 부하율(Pe)를 산정합니다. 구체적으로는 부하시간을 단위시간(Ti)마다 계단형태로 구한후, 그실부하율을 평균치(Pi)로 근사하면, 등가 부하율을 계산할 수 있습니다.

$$Pe(\%) = \sqrt{\frac{(P_1)^2T_1 + (P_2)^2T_2 + \cdots + (P_i)^2T_i + \cdots + (P_k)^2T_k}{T_1 + T_2 + \cdots + T_i + \cdots + T_k}}$$

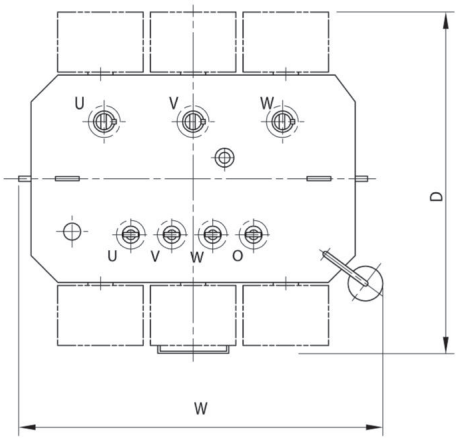
(그림 2. 부하 손실)

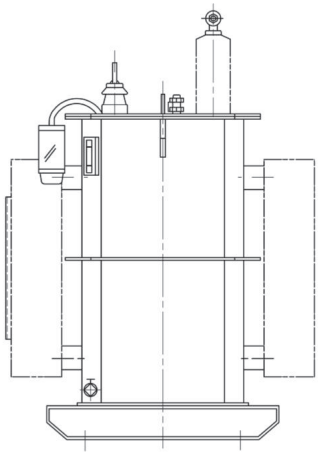


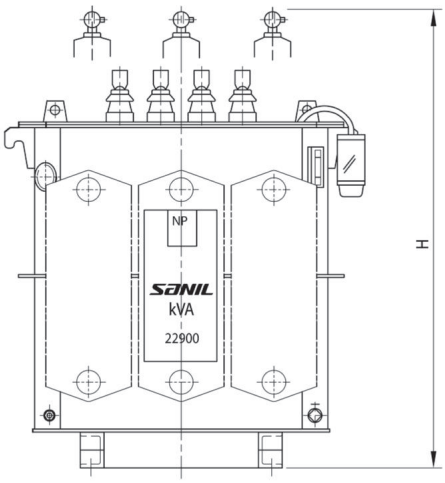
High efficiency Transformers
(고효율 저소음 유입 변압기)

Product range

- Capacity : Upto 3000kVA
- Frequency : 60Hz
- High Voltage : 22900V
- Low Voltage : 380y220V
- Tap Voltage : 23.9/22.9/21.9/20.9/19.9kV





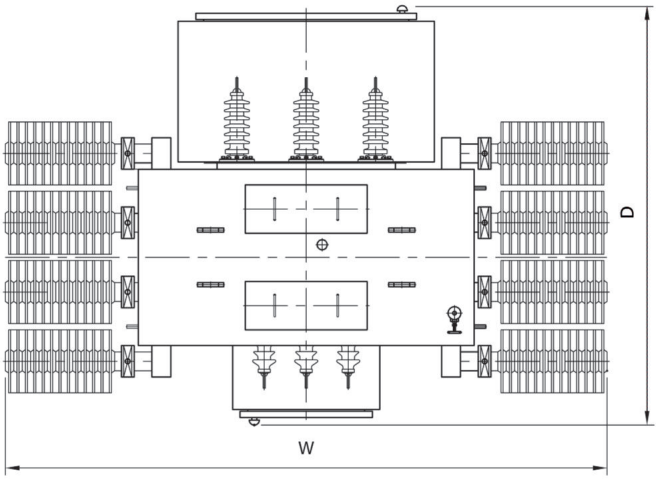


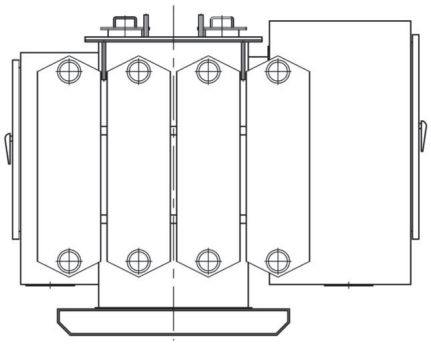
Characteristic & Dimension

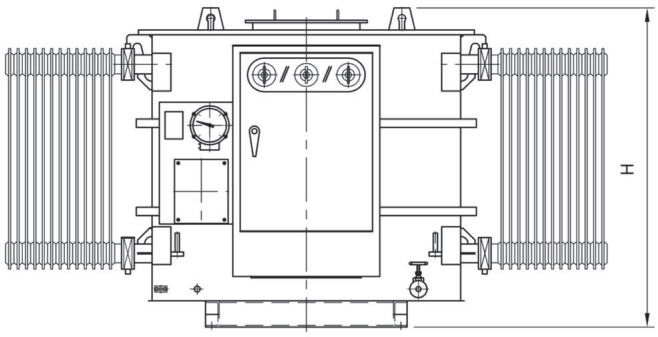
Top-Bushing Type [Three Phase 22900V / 380-220V]

용량 Capacity (kVA)	기 존 부 하 율		소음 (dB)	Dimensions			Oil (ℓ)	TOTAL WEIGH(Kg)
	표준소비효율	최저소비효율		W (㎜)	D (㎜)	H (㎜)		
100	99.0	98.0	53	1,000	700	1,300	200	650
150	99.0	98.1	53	1,000	800	1,350	210	800
200	99.0	98.2	53	1,100	940	1,350	255	1,000
300	99.1	98.4	53	1,100	1,000	1,400	290	1,200
400	99.1	98.4	54	1,100	1,150	1,400	320	1,400
500	99.1	98.5	55	1,200	1,200	1,450	370	1,600
600	99.2	98.5	55	1,200	1,350	1,450	400	1,800
750	99.2	98.6	56	1,250	1,500	1,500	490	2,150
1000	99.3	98.7	56	1,250	1,700	1,500	500	2,500
1250	99.3	98.8	57	1,450	1,700	1,850	900	3,500
1500	99.3	98.8	57	1,450	1,800	1,950	950	4,000
2000	99.3	98.9	57	2,000	2,000	2,250	1,500	5,500
2500	99.4	99.0	58	2,150	2,250	2,600	1,600	6,500
3000	99.4	99.1	59	2,200	2,400	2,700	1,900	7,000

※ 상기의 Data는 개정안이며, 확정 규격에 따라 변경될 수 있습니다.







Characteristic & Dimension

Side-Bushing Type [Three Phase 22900V / 380-220V]

용량 Capacity (kVA)	기 존 부 하 율		소음 (dB)	Dimensions			Oil (ℓ)	TOTAL WEIGH(Kg)
	표준소비효율	최저소비효율		W (㎜)	D (㎜)	H (㎜)		
100	99.0	98.0	53	1,100	1,550	1,150	230	750
150	99.0	98.1	53	1,150	1,550	1,150	250	950
200	99.0	98.2	53	1,150	1,600	1,200	300	1,150
300	99.1	98.4	53	1,300	1,600	1,250	350	1,400
400	99.1	98.4	54	1,500	1,700	1,300	430	1,600
500	99.1	98.5	55	1,650	1,750	1,350	450	1,900
600	99.2	98.5	55	1,750	1,800	1,400	500	2,150
750	99.2	98.6	56	1,900	1,850	1,400	580	2,550
1000	99.3	98.7	56	2,100	1,900	1,450	600	3,000
1250	99.3	98.8	57	2,300	1,950	1,500	1,100	4,000
1500	99.3	98.8	57	2,500	2,000	1,500	1,140	4,700
2000	99.3	98.9	57	2,600	2,050	1,600	1,800	6,400
2500	99.4	99.0	58	2,800	2,100	1,800	1,900	8,000
3000	99.4	99.1	59	3,000	2,200	2,000	2,250	8,500

※ 상기의 Data는 개정안이며, 확정 규격에 따라 변경될 수 있습니다.

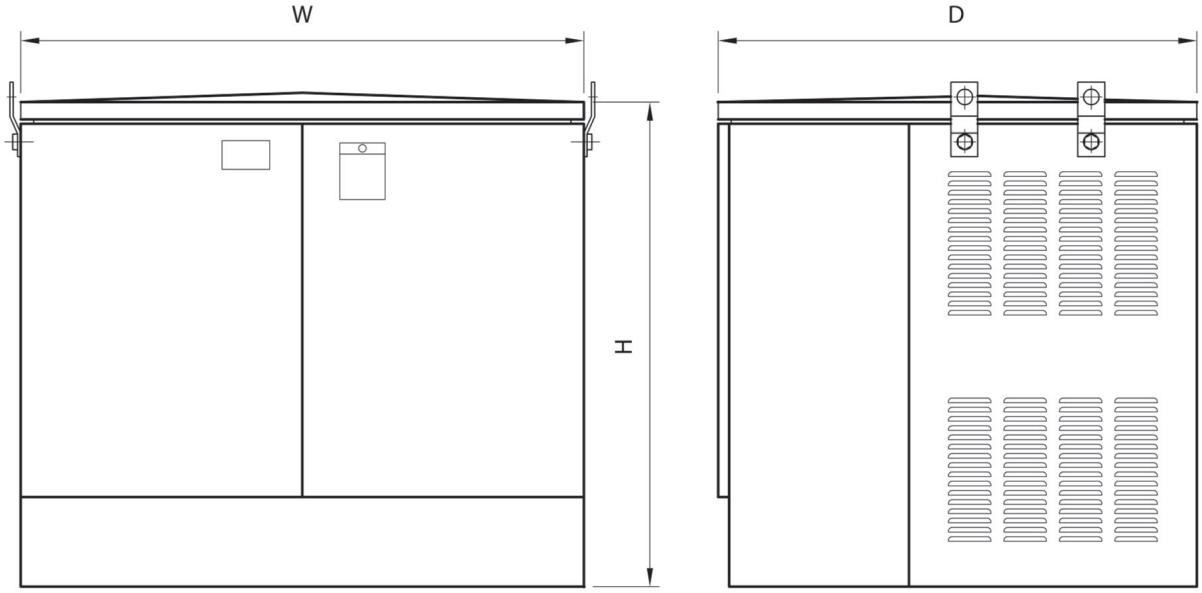
Pad Mounted Transformers

Pad-mounted type transformers installed on the ground or sidewalk by underground distribution loads.
For radial or loop feed applications, both live front or dead front construction is availabie.
It is generally fixed on concrete or reinforced concrete ground with proper provisions of enclosure to protect person from any possible injury.
With such special structure for safety, and with fine appearance, this type is recommended to use in the residential quarter, school, park, street or sidewalk, and so on wherever safety and appearance is major consideration.

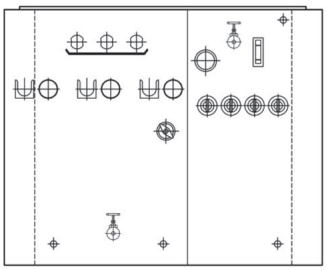
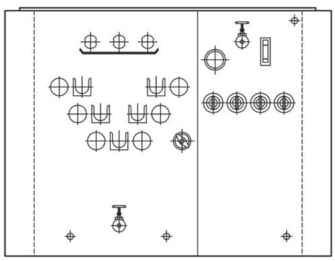
지상 설치형 변압기는 지중 송전선 수전지역에 설치되며, 전기적 보호장치인 휴즈를 구비하여 사고 우려가 적고 외관이 심플하고 미려하여 주택가도로, 공원, 학교, 골프장 등 수용가에 근접 설치, 사용에 적합합니다.

Accessories

1) Tank
2) Bushing well
3) Bushing insert
4) Stand off insulator
5) Protective cap
6) BAY-O-NET fuse holder
7) Dual sensing fuse
8) ELSP C.L. fuse
9) Tap changer
10) Load break switch
11) Dual voltage switch(option)
12) M.O.V.E arrester(option)
13) Oil leverl indicator
14) Filter valve
15) Thermometer
16) Pressure relief valve
17) Secondary bushing



Characteristic & Dimension

Dimension	Capacity (kVA)	BIL 95 kV			BIL 150 kV		
		W (mm)	D (mm)	H (mm)	W (mm)	D (mm)	H (mm)
Dead front Radial feed 	100	1300	1000	1400	1400	1000	1400
	150	1300	1000	1400	1400	1000	1400
	200	1300	1100	1400	1400	1200	1400
	300	1400	1200	1500	1400	1300	1600
	500	1400	1500	1600	1500	1600	1700
	750	1600	1600	1650	1600	1600	1700
	1000	1700	1700	1700	1700	1700	1800
	1500	1800	1850	1750	1900	1850	1900
Dead front Loop feed 	100	1400	1000	1500	1500	1000	1500
	150	1400	1000	1500	1500	1000	1500
	200	1500	1100	1500	1500	1200	1500
	300	1500	1200	1600	1500	1300	1700
	500	1600	1500	1700	1600	1600	1800
	750	1700	1600	1750	1700	1600	1800
	1000	1800	1700	1800	1800	1700	1900
	1500	1900	1850	1850	1900	1850	1950

※ 상기의 Data는 참고치이며, 상세사양에 따라 변경될 수 있습니다.

Pole mounted Transformers

• Single phase
(One Bushing)

• Single phase
(Two Bushing)

Dimension & Weight

Single phase(One Bushing) 22900V Grdy / 13200V-230V

Capacity (kVA)	Characteristics			Dimension(mm)			Oil (ℓ)	Weight (Kg)
	Efficiency (%)	Vtg. Reg. (%)	Exciting current(%)	W	D	H		
10	97.8	2.0	1.2	470	560	1030	40	135
20	98.1	1.7	1.2	510	600	1060	50	175
30	98.3	1.5	1.0	530	620	1080	60	210
50	98.5	1.4	0.8	680	660	1100	80	280
75	98.5	1.4	0.8	740	710	1140	110	360
100	98.6	1.3	0.7	840	730	1150	110	430

Single phase(Two Bushing) 22900V - 230V

Capacity (kVA)	Characteristics			Dimension(mm)			Oil (ℓ)	Weight (Kg)
	Efficiency (%)	Vtg. Reg. (%)	Exciting current(%)	W	D	H		
10	97.0	2.4	3.0	470	560	1030	40	150
20	97.4	2.1	3.0	510	600	1060	50	190
30	97.6	1.9	2.5	530	620	1080	60	230
50	97.9	1.8	2.0	680	660	1100	80	300
75	98.0	1.8	2.0	740	710	1140	110	370
100	98.1	1.7	2.0	840	730	1150	110	450

※ 상기의 Data는 참고치이며, 상세사양에 따라 변경될 수 있습니다.

Manufacturing processing
(제조공정)

HV. LV. Windings(1,2차 권선)

Windings(코일)

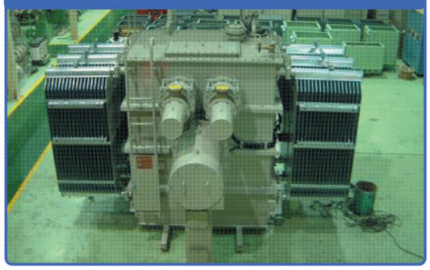
Drying(건조)

Core Assembly(철심제작)

Core & Coil Assembly(중신 조립)

Tanking(완성 조립)

Finished Product(완제품)



Final Testing(최종 시험)

VPI Transformers

It is Newly developed transformer which features highly safe and effective functions adopting the state of the art technologies such as VPI (Vacuum Pressure Impregnation) treatment together with high temperature insulation material NOMEX that is available up to 220˚C. It also has excellent electrical & mechanical characteristics that are very safe and economical to use.

신개념 변압기로 220℃까지 사용 가능한 절연재료(NOMEX) 및 최신의 전자동VPI 설비와 선진기술을 적용하여 우수한 전기, 기계적 특성을 보유한 매우 안전하고 경제적이며, 친환경 제품입니다.

High stability (높은 안정성)

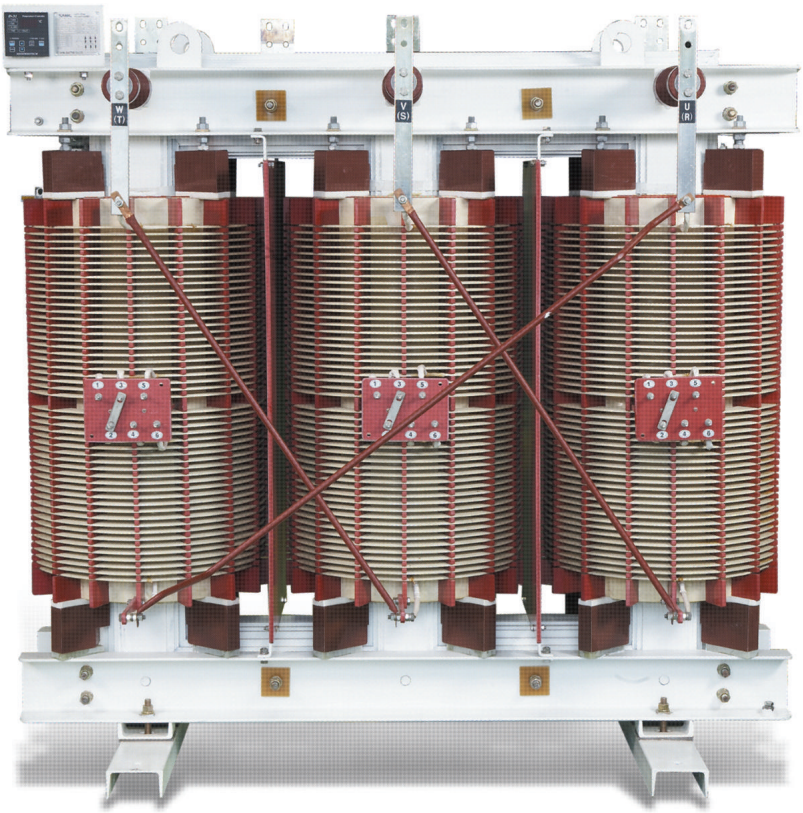
- Flame retardant(using premium flame-retardant materials)
- Minimization of losses of human/property by fire.

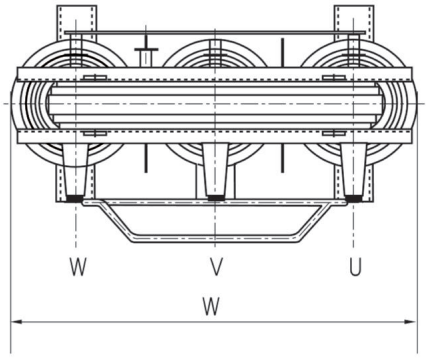
High reliability (고 신뢰성)

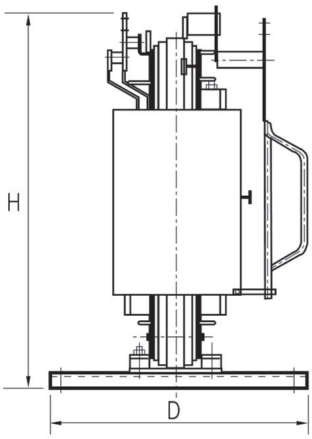
- Excellent over-load capacity
- No crack
- Minimization of occurrence of partial discharge
- Excellent short circuit strength

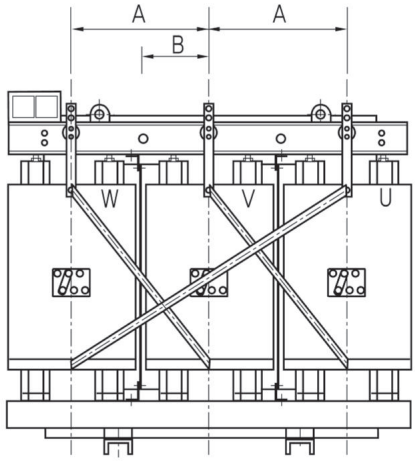
Environment friendly (환경 친화적)

- No used insulation oil.
- Materials like conductors can be recycled easily at lower cost.









Dimension & Weight

Three phase 22900V-L.V.

Capacity (kVA)	Dimension(mm)			Weight (Kg)
	W	D	H	
100	1200	700	1100	600
200	1300	700	1200	800
300	1400	740	1290	980
400	1450	750	1350	1150
500	1500	750	1400	1400
750	1550	850	1450	1850
1000	1600	850	1550	2400
1500	1700	900	1700	3300
2000	1800	900	1900	4050
2500	1950	900	1950	4600
3000	2200	950	2100	5500
4000	2300	1200	2200	6000
5000	2400	1300	2300	7300
7500	2550	1400	2400	8500
10000	2800	1450	2450	9500

※ 상기의 Data는 참고치이며, 상세사양에 따라 변경될 수 있습니다.

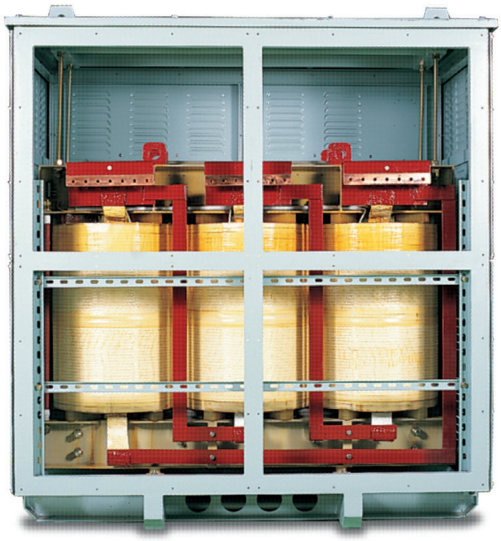
Dry Type Transformers

Ratings

- Frequency : 60Hz, 50Hz
- Capacity : Up to 10MVA
- Primary Voltage : Up to 36KV
- Secondary Voltage : 208Y/120V, 380Y/220V 380Y/440V etc.
- Vector Symbol : Ddo, Dynll etc.

Special Products

- Marine Transformer (선박용 변압기)
- Railroad Vehicle Transformer (철도차량용 변압기)
- Furnace Type (로용 변압기)
- Scott Connection (스코트 결선 변압기)
- Explosion Proof Type (갱내용 변압기)
- Inverter Transformer of ups



Three phase 6600/3300-L.V

Capacity (kVA)	Characteristics			Dimension(mm)			Totel WT. (kg)
	Efficiency (%)	Vtg. Reg. (%)	Exciting current(%)	W (mm)	D (mm)	H (mm)	
30	96.5	3.0	9.0	550	430	650	200
50	96.5	2.8	8.5	650	450	700	240
75	96.8	2.6	8.0	650	480	800	360
100	97.0	2.5	7.5	750	500	850	430
150	97.2	2.4	7.0	800	530	850	500
200	97.3	2.3	7.0	900	550	900	680
300	97.5	2.2	7.0	1000	600	1100	840
400	97.7	2.1	6.0	1150	650	1250	1160
500	97.9	2.0	6.0	1300	700	1400	1700
750	98.0	1.9	6.0	1350	700	1400	2250
1000	98.2	1.8	5.0	1400	750	1500	2900
1500	98.3	1.7	5.0	1700	800	1850	3500
2000	98.4	1.6	5.0	1850	800	1900	4200
3000	98.6	1.5	4.5	1900	850	1950	5100
4000	98.9	1.2	2.0	2100	1000	2100	6500
5000	99.0	1.1	2.0	2200	1100	2200	7500

※ 상기의 Data는 참고치이며, 상세사양에 따라 변경될 수 있습니다.

Insulation System

ITEM		JEC	ANSI	IEC
Winding Temperature Rise (Resistance method)	A	55	55	60
	E	70	75	75
	B	75	80	80
	F	95	105	100
	H	120	120	125

Maximum Temperature of Insulation(℃)

Classification	JEC	ANSI	IEC
A	105	105	105
E	120	120	120
B	130	130	130
F	155	155	155
H	180	180	180

Dry Type

Fig. 1

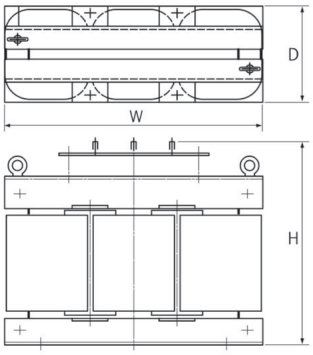


Fig. 2

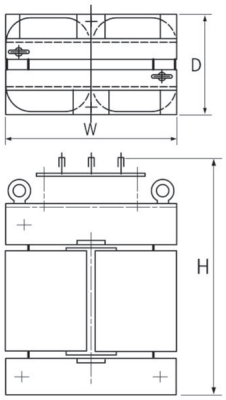
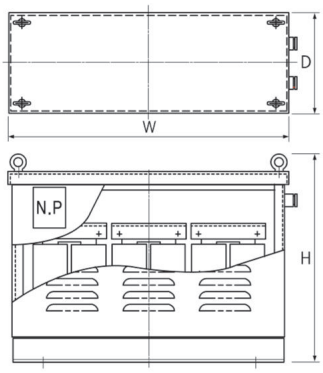


Fig. 3



Three phase L.V-L.V

Capacity (kVA)	Characteristics			Dimension(mm)			Totel WT. (kg)	Fig. No.
	Efficiency (%)	Vtg. Reg. (%)	Exciting current(%)	W (mm)	D (mm)	H (mm)		
30	96.5	3.0	9.0	480	380	500	140	1
50	96.5	2.8	8.5	580	400	580	200	
75	96.8	2.6	8.0	600	400	650	280	
100	97.0	2.5	7.5	670	450	800	360	
150	97.2	2.4	7.0	670	530	850	440	
200	97.4	2.3	7.0	810	550	950	520	
300	97.6	2.2	7.0	840	600	1000	730	
400	97.8	2.1	6.0	910	650	1100	950	
500	97.9	2.0	6.0	1100	680	1250	1300	
750	98.0	1.9	6.0	1300	700	1300	1800	
1000	98.2	1.8	5.0	1400	730	1350	2300	
1500	98.3	1.7	5.0	1500	750	1400	2900	
2000	98.4	1.6	5.0	1600	800	1500	3600	

Single phase L.V-L.V

Capacity (kVA)	Characteristics			Dimension(mm)			Totel WT. (kg)	Fig. No.
	Efficiency (%)	Vtg. Reg. (%)	Exciting current(%)	W (mm)	D (mm)	H (mm)		
30	96.5	2.9	8.5	400	350	500	120	2
50	96.7	2.8	8.5	500	350	650	180	
75	96.9	2.6	8.0	550	460	760	240	
100	97.1	2.5	7.5	600	480	800	320	
150	97.3	2.4	7.0	700	500	840	400	
200	97.5	2.3	7.0	750	580	900	480	
300	97.4	2.2	6.5	800	630	1050	650	
500	97.9	2.0	6.0	850	650	1100	1100	
750	98.1	1.9	6.0	900	700	1150	1400	

Marine Transformer Three phase L.V-L.V

Capacity (kVA)	Characteristics			Dimension(mm)			Totel WT. (kg)	Fig. No.
	Efficiency (%)	Vtg. Reg. (%)	Exciting current(%)	W (mm)	D (mm)	H (mm)		
15(5kx3)	96.0	2.5	10.0	960	420	900	190	3
30(10kx3)	96.5	2.5	8.0	1140	460	900	300	
45(15kx3)	96.5	2.5	8.0	1140	460	900	300	
60(20kx3)	96.5	2.5	8.0	1140	460	900	350	
75(25kx3)	97.0	2.5	5.0	1250	480	1000	400	
90(30kx3)	97.0	2.5	5.0	1250	480	1000	550	
120(40kx3)	97.0	2.5	5.0	1250	480	1000	650	
135(45kx3)	97.0	2.5	5.0	1400	520	1100	750	
150(50kx3)	97.0	2.5	5.0	1400	520	1100	900	
180(60kx3)	97.5	2.5	5.0	1710	610	1200	1050	
270(90kx3)	98.0	2.5	5.0	2000	710	1200	1300	
300(100kx3)	98.0	2.5	5.0	2000	710	1200	1400	

※ 상기의 Data는 참고치이며, 상세사양에 따라 변경될 수 있습니다.

Reactors

Production Range and Specification:

Motor Starting Reactors

The Induction Motor needs a huge starting current. If starting current affects the power source of any other loads, starting current must be regulated reduced voltage starting method. In the reduced voltage starting methods, there are REACTOR starting method and AUTO-TRANSFORMER (kondorfer) starting method.

유도전동기는 기동전류가 매우 큽니다. 기동전류가 전원 또는 다른 부하에 영향을 미치면 기동전류를 감압기동방법으로 기동전류를 억제해야 합니다. 감압방법으로는 리액터기동방법과 단권변압기 (Kondonfer) 기동방법이 있습니다.

Specification

- 상수 (number of Phase) : 3Phase
- 주파수(Rated Frequency) : 60Hz or 50Hz
- 정격전압(Rated Voltage) : 3300 / 6600, 440/ 220V
- 정격출력(Rated Capacity) : 22 ~ 7500kW
- 냉각방식(Cooling Method) : Dry Type or Mold Type
- 탭(Tap) : 50%, 65%, 80% (Standard Tap)
- 정격시간(Rating Time) : 1min, 3min, 5min
- 절연등급(Insulation Level) : B, F, H Class

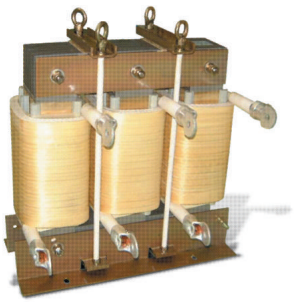
Condenser Series Reactors

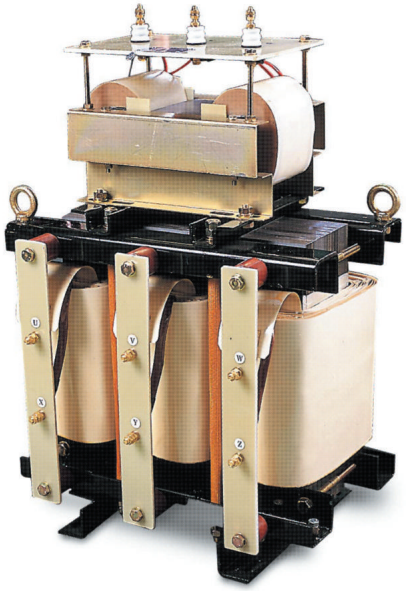
The Series Reactors, that are inserted in the capacitors or capacitor banks, are intended to reduce a distortion of waveform and to protect the contactors of a circuit breaker or switch by suppressing the inrush current at the time of closing the capacitors or capacitor banks.

콘덴서에 직렬 리액터를 삽입 하므로써 파형의 왜곡을 방지합니다. 또 콘덴서의 회로 투입시의 돌입전류를 억제하므로써 차단기 또는 개폐기의 접점을 보호합니다

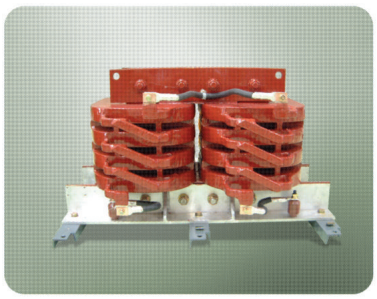
Specification

- 상수 (number of Phase) : 3Phase
- 주파수(Rated Frequency) : 60Hz or 50Hz
- 정격전압(Rated Voltage) : 3300 / 6600, 440/ 220V
- 정격출력(Rated Capacity) : up to 1000 kVA
- 냉각방식(Cooling Method) : Dry Type or Mold Type
- 절연등급(Insulation Level) : B, F, H Class

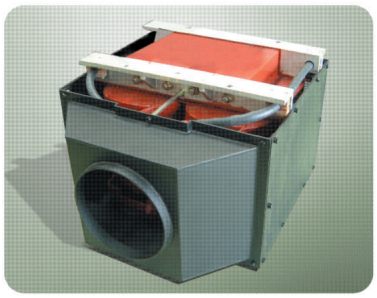


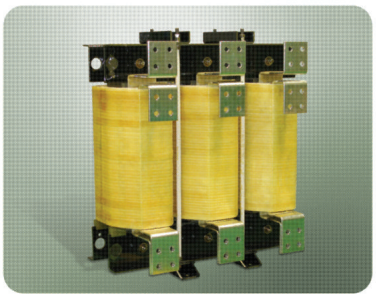


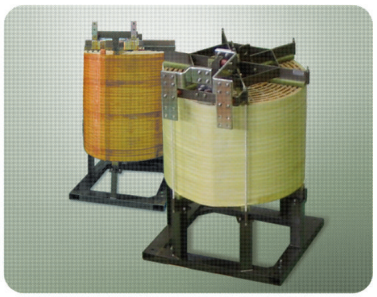
Inverter Reactors / DC Reactors



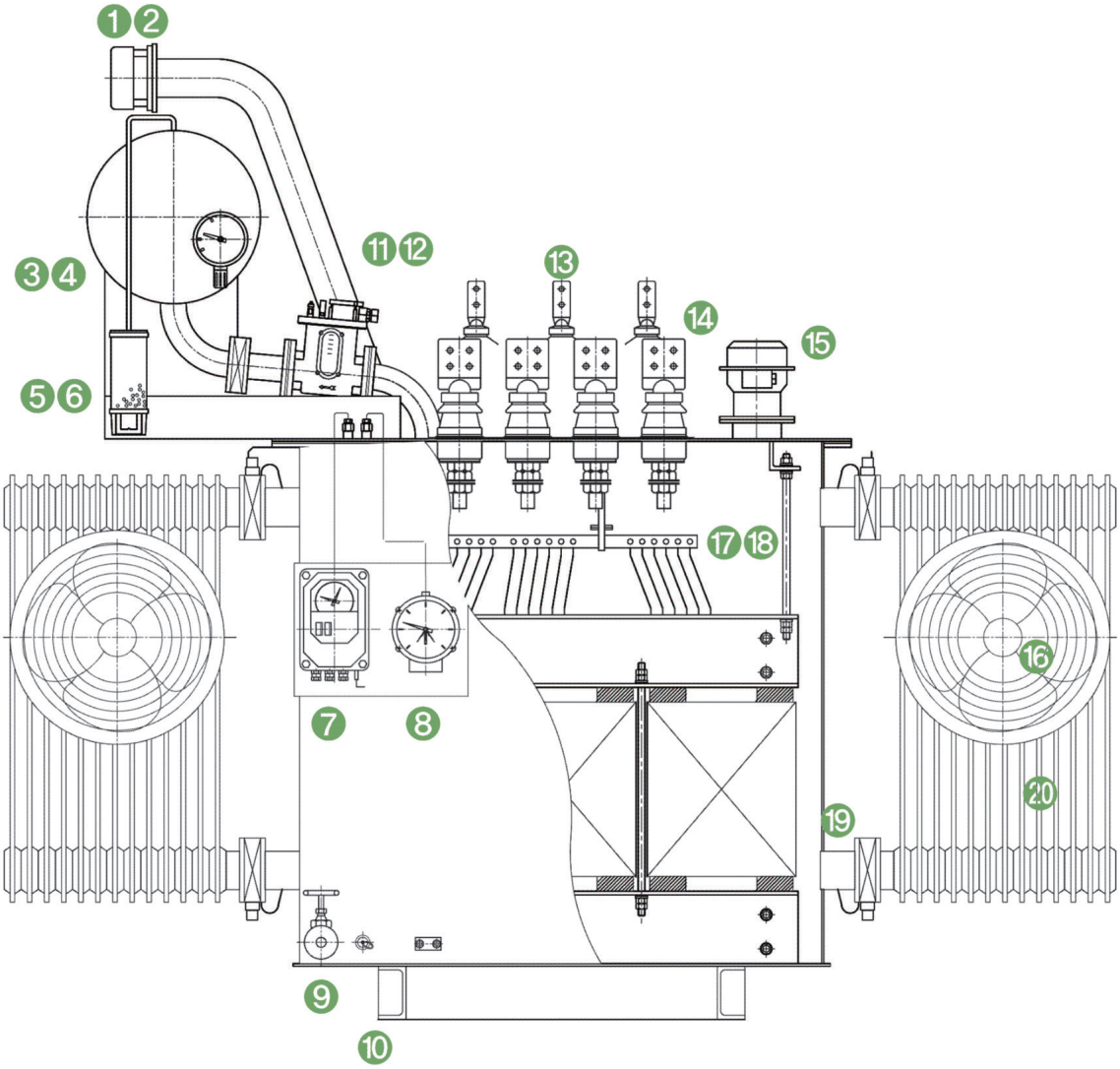
Special Purpose Reactors (AC,DC)







Accessories & Protection System



방압안전장치(Auto Reset)
Pressure Relief Device

1

방압안전장치
Pressure Relief Device

2

유면계
Oil Lever Indicator

3

유면계
Oil Lever Indicator

4

흡습호흡기
Dehydreting Breather

5

흡습호흡기
Dehydreting Breather

6

권선온도계
Winding Temp. Indicator

7

유 온도계
Oil Temp. Indicator

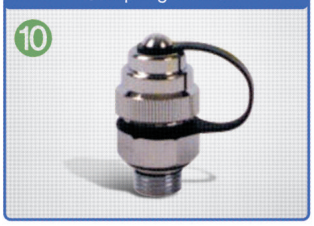
8

배유 밸브
Oil Drain Valve

9

샘플링 밸브
Sampling Valve

10



부흐홀쯔계전기(GRD)
Buchhoiz Relay

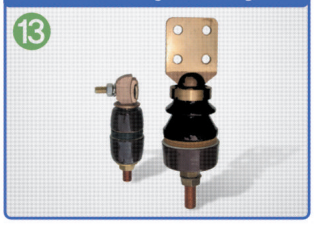
11

방압안전장치
Pressure Relief Device

12

저압붓싱
Low Voltage Bushing

13



고압붓싱
High Voltage Bushing

14

충격압력 계전기
Sudden Pressure Relay

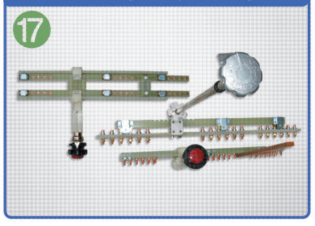
15

쿨링팬(송풍기)
Cooling Fan

16

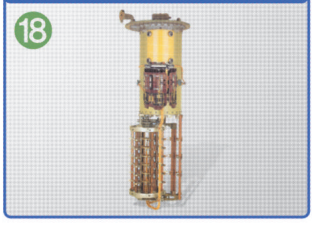
무전압 탭 절환기
No-Voltage Tap Changer

17



부하시 탭 절환기
On Load TAP Changer

18

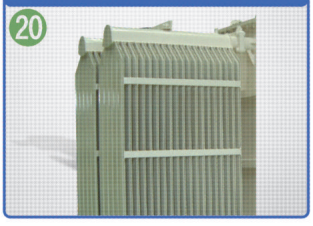


방열기 밸브
Radiator Valve

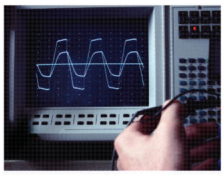
19

방열기
Radiator

20



Quality Assurance
품질보증



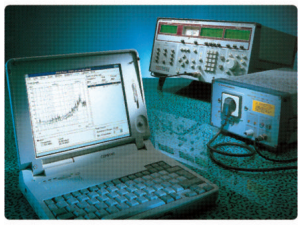
Quality Policy

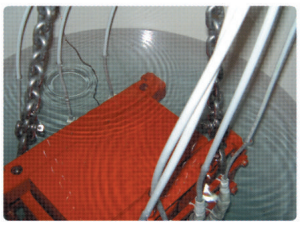
The quality assurance of SANIL is guaranteed to provide top-class products to customers through the on-going R & D for improvement and certified quality system.

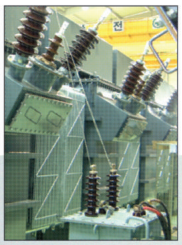
Quality Goal

Inspection & Test

	Inspection & Test Item	Test Type		
		Routine	Type	Special
1	Construction & Dimension Check	o		
2	Winding Resistance Measurement	o		
3	Ratio Check	o		
4	Phase Relation Check	o		
5	Insulation Resistance Measurement	o		
6	No-Load Loss & Current Measurement	o		
7	Impedance Voltage & Load Loss Measurement	o		
8	Temperature Rise Test		o	
9	Impulse Voltage Test		o	
10	Separate source Voltage Withstand Test	o		
11	Induced Voltage Withstand Test	o		
12	Sound Level Measurement			o
13	Calculation of Efficiency & Voltage Regulation	o		







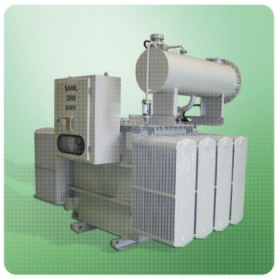

SOKEN PARTIAL DISCHARGE TESTING SYSTEM


SANIL

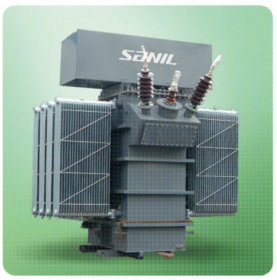
SANIL Products

■ Production :

- Distribution Transformers
- Pole Mounted Transformers
- Power Transformers
- Cast / Dry Transformers
- PAD Mounted Transformers
- Marine Transformers



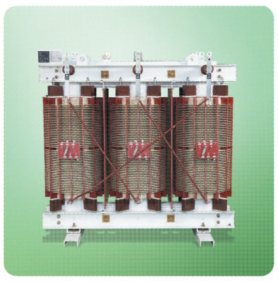




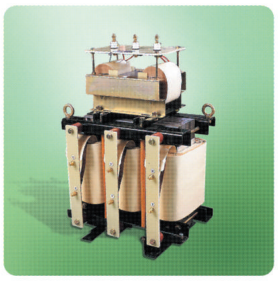


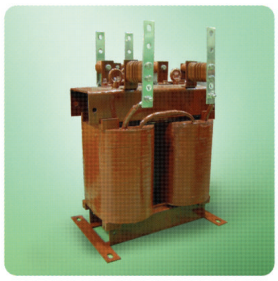


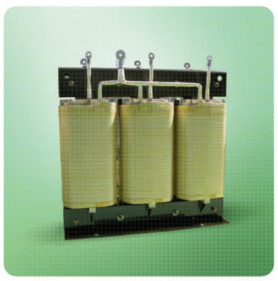
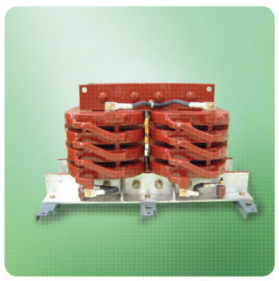

- VPI Transformers
- Inverter Reactors
- Beam Sensors
- Condenser Series Reactors
- DC Reactors
- Proximity S/W Sensor
- Motor Starting Reactors
- Soft-Starter
- Ultra Sonic Sensor







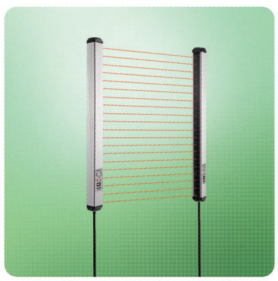


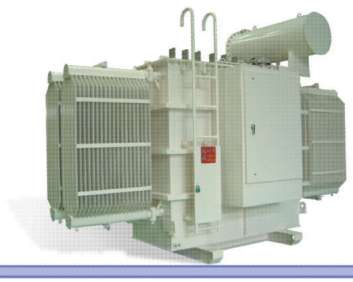









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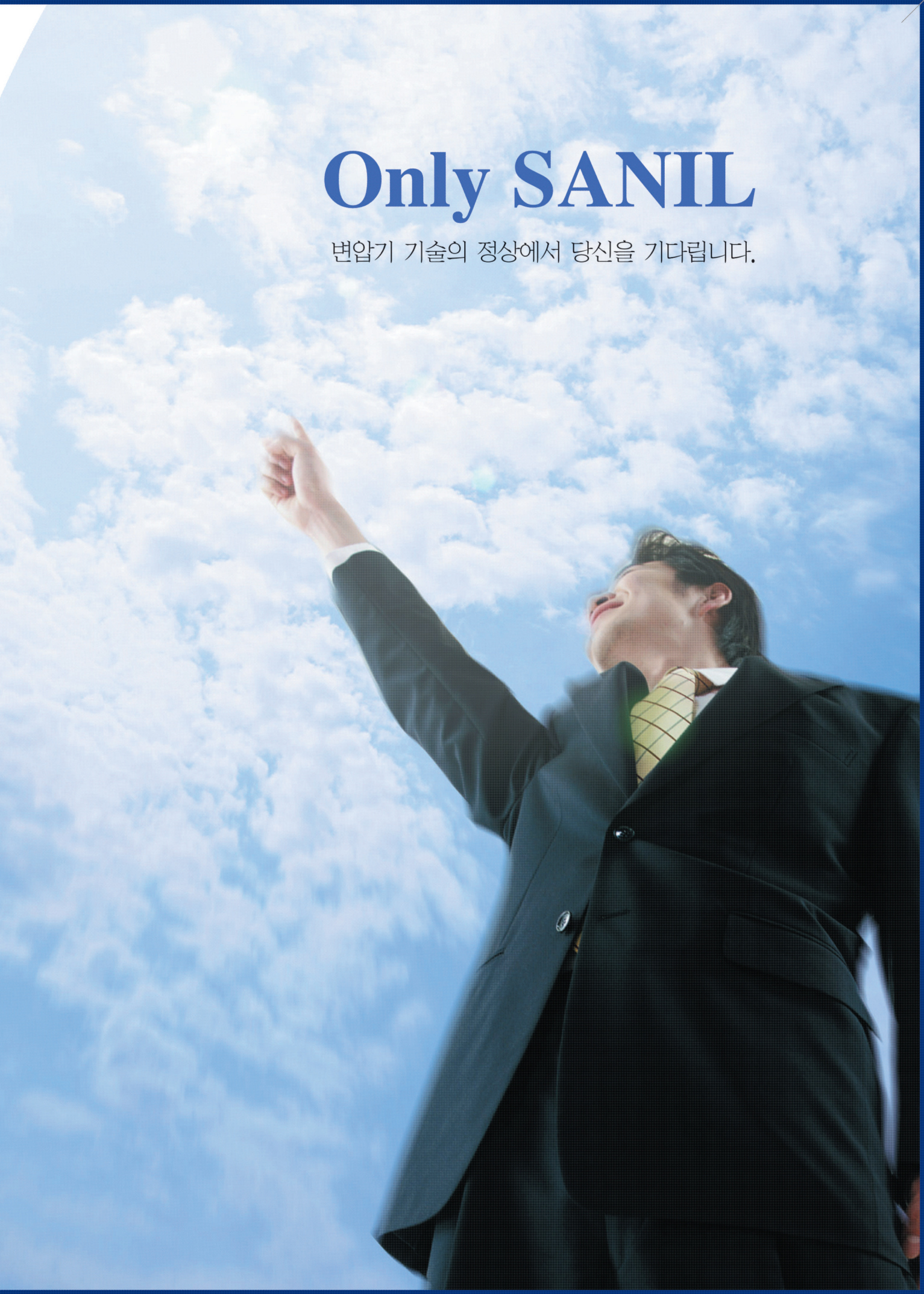
늘 새로워지는 대자연, 무한한 에너지
그 속에 편리하고 편안한 첨단기술로
자연에도 인류에도 모두 행복을 주는 일을
하고 있습니다.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