

NIROU TRANS PRODUCTS



NIROU TRANS CO.

Since 1990

About Us

Nirou Trans Company was established in 1990. The activity of this company is production of current and voltage transformers in the range of 6 kV to 800 kV, transformer bushings up to 420 kV, high voltage power capacitors, Generator Circuit Breakers and GIS Switchgears.

All the products are designed, manufactured and tested based on customers' requirements and in accordance with internationally well-known standards.

Quality and conformity with customers' requirements have been the primary concern of Nirou Trans Company and in line with this policy, NTC's quality system was certified according to ISO 9001:2015.



Nirou Trans Holding

Nirou Trans owns four subsidiary companies:

- **Sarv Nirou Shiraz**

Field of Activity: Manufacturing GIS Switchgears, Indoor Load Break Switches, Plugin Bushings and Capacitive Insulators.

- **Tosee Arman Farda**

Field of Activity: Investment and Stock Trading

- **Tosee Nirou Arman Sharif**

Field of Activity: Designing, Manufacturing and Operating Distributed Generators and Solar Power Plants

- **Tavan Arman Sanat Shiraz**

Field of Activity: Designing, Manufacturing and Commissioning Capacitor Banks

Gas-Insulated Switchgear Type: ELK-04

Under License of ABB Switzerland



Gas-Insulated Switchgear (GIS) is a compact metal encapsulated switchgear consisting of high-voltage components such as circuit-breakers and disconnectors, which can be safely operated in confined spaces.

For the first time in Iran, we are proud to announce that Nirou Trans Co. has started to manufacture GIS switchgears under license of ABB Switzerland.

ABB is one of the technology leaders in the range of gas-insulated switchgears. No company has more hands-on experience, gained through manufacturing thousands of GIS appliances for various climatic and operating conditions.

Some of the Features of ELK-04

- Modular, flexible and volume optimized
- Minimum volume of insulating gas, high gas tightness
- Reliable function at high altitudes
- High reliability and availability
- Low life cycle and maintenance cost
- Long economic life-time (>40 years)
- Complete three phase encapsulation

Legend

1. Disconnecter and earthing switch (busbar)
2. Circuit-breaker
3. Current transformer
4. Disconnecter and earthing switch (feeder)
5. Voltage transformer
6. Make-proof earthing switch
7. Cable exit
8. Local control cubicle (LCC)



ELK-04 , 145kV		
Rated voltage	kV	145
Rated short-duration power-frequency withstand voltage	kV	275
Rated short-duration power-frequency withstand voltage across isolating distance	kV	315
Rated lightning impulse withstand voltage	kV	650
Rated lightning impulse withstand voltage across isolating distance	kV	750
Rated frequency	Hz	50
Rated normal current	A	3150
Rated short-time withstand current	kA	40
Rated duration of short-circuit	s	3
Rated peak withstand current	kA	104
Installation		Indoor / Outdoor
Rated filling pressure / minimum functional pressure (abs. at 20 C): Circuit-breaker	MPa	0.7 / 0.6
Rated filling pressure / minimum functional pressure (abs. at 20 C): other components	MPa	0.6 / 0.52
Rated operating sequence		O-CO / CO-CO / O-CO-CO

The above data are not limiting values. Additional data may be provided by request.

Tank Type Current Transformer Type: IMB



Tank Type Current Transformer
(IMB) 72.5 - 800 kV

IMB tank type (hairpin design) current transformers are very flexible, with regard to core space. The primary conductor (hairpin) is insulated with a unique capacitive layer which is made up of kraft paper and aluminium foils which provides high insulation resistance, low dielectric loss and good ageing property. The cores are located in the bottom tank, and complete transformer is filled with a unique mixture of quartz and oil. As a result, it is possible to design an expansion system entirely without moving parts.

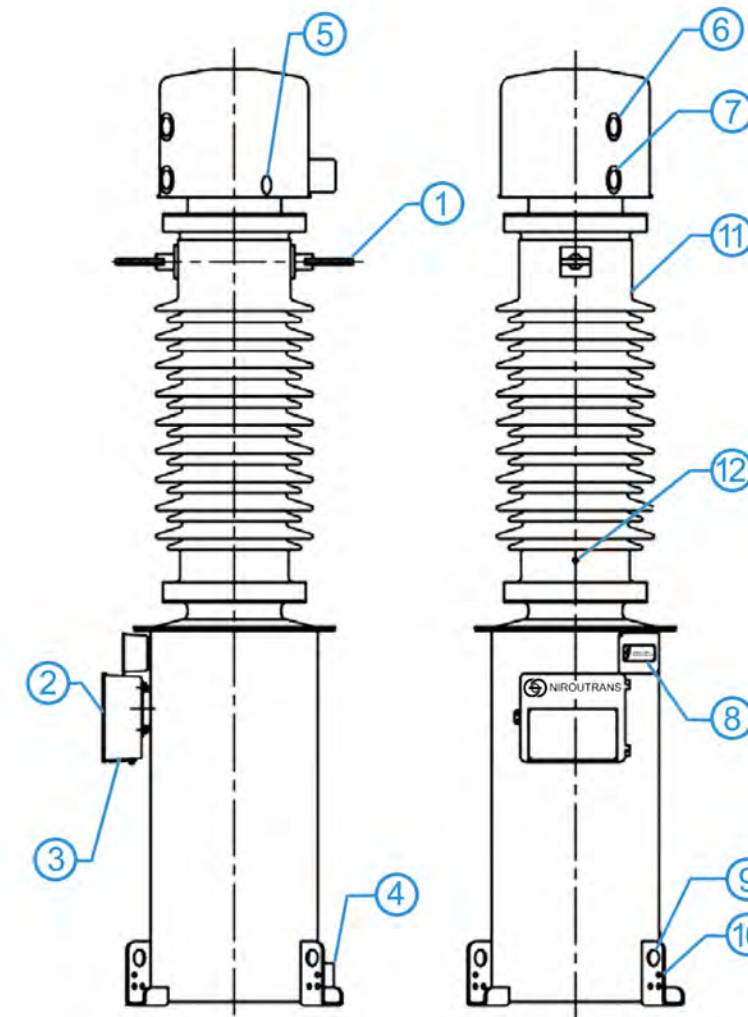
IMB



Features:

- Unique filling composition, oil together with pure quartz-grains, resulting in compact design with lower oil volume.
- Hermetically sealed which eliminates the need for regular maintenance procedures.
- No oil change required as expansion room is filled with nitrogen.
- All external iron parts are hot-dip galvanized.
- High seismic withstand capability.
- The option to choose the number of cores according to customers' need.
- Sand supports cores & primary winding.
- Simple installation & minimal maintenance.
- Both types of insulators are available (porcelain or composite).

Tank Type Current Transformer Type: IMB



Main Parts:

- ① Primary Terminal: Flat Type (Aluminium)
- ② Secondary Terminal Box
- ③ Removable Undrilled Gland Plate
- ④ Oil Outlet Valve
- ⑤ Oil Filling Plug
- ⑥ Upper Oil-level Glass Blind (Always bright)
- ⑦ Lower Oil-level Glass Blind (Always dark by correct oil-level. Bright by too low oil-level.)
- ⑧ Capacitive Voltage Tap with protective cap and cable entry threaded
- ⑨ Lifting Lug
- ⑩ Earth Clamp for Conductor (2 pcs)
- ⑪ Insulator
- ⑫ Center of Gravity

		HV-Current Transformer Type: IMB						
Highest System Voltage	Um (kV)	72.5	145	245	420	550	800	
Insulation Level	BIL (kV)	140 - 325	275 - 650	460 - 1050	630 - 1050 - 1425	680 - 1175 - 1550	975 - 1550 - 2100	
Rated Primary Current	I _{pn} (A)	Up to 4000						
Rated Secondary Current	I _{sn} (A)	1 or 5						
Rated Primary Thermal Current	I _{tn} (kA)	Up to 50						
Number of Cores	-	Up to 7						
Class	-	5P, 10P, X, TPY, 0.2 S, 0.2, 0.5						
Rated Frequency	F (Hz)	50 / 60						
Creepage Distance	mm / kV	Up to 31						

(Note) Special designs can be offered based on customer's request.

Capacitor Voltage Transformers Type: CPA & CPB



Capacitor Voltage Transformers
Type CPA & CPB , 72.5 - 800 kV

NTC's capacitor voltage transformers (CVTs) are intended for connection between phase and ground in networks with isolated or grounded neutral.

NTC offers a world-class CVT with efficient ferroresonance suppression and good transient response. The design corresponds to the requirements of IEC and all national standards.

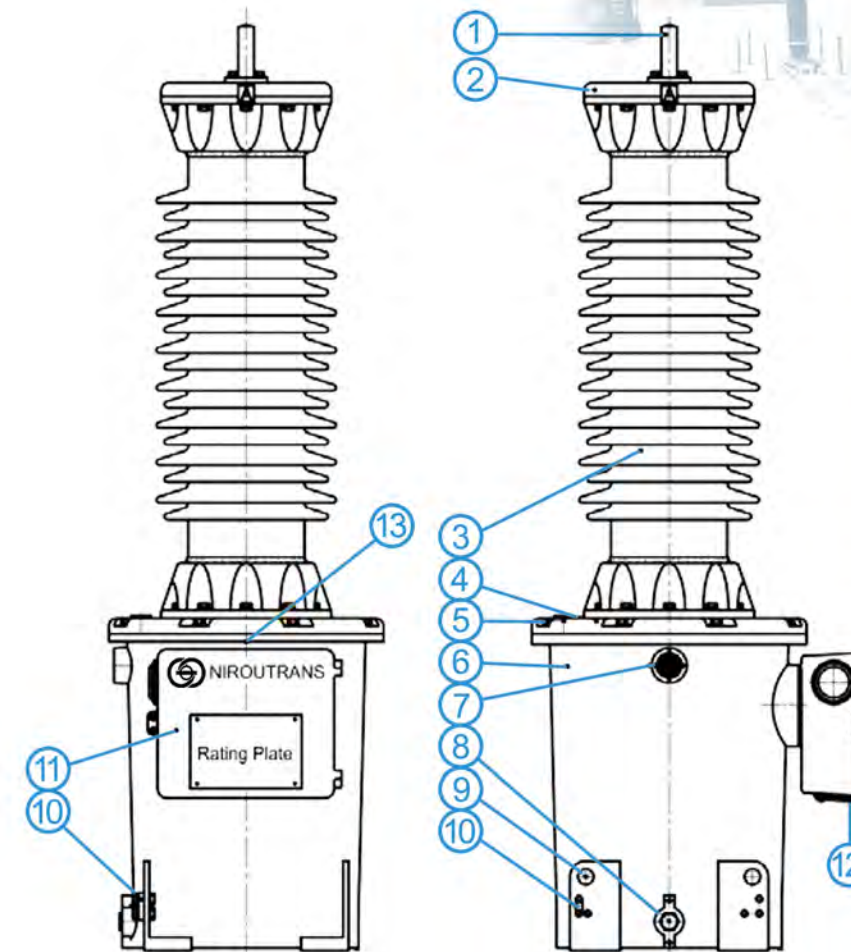
CPA CPB



Features:

- The transformer compensating reactor and damping circuit are assembled into a hermetically sealed, oil filled aluminium tank.
- The windings for ratio adjustment are easily accessible to allow the user to optimize the transformer accuracy.
- The dielectric used in the capacitor divider consists of a combination of oil impregnated paper and polypropylene film resulting in CPA and CPB being practically impervious to temperature variation.
- From the design point, the CPA and CPB are identical, apart from the CPB having a larger iron core enabling it to withstand higher loads.
- Both types of insulators are available (porcelain or composite).

Capacitor Voltage Transformers Type: CPA & CPB



Main Parts:

- ① Primary Terminal (Aluminium)
- ② HV Plate
- ③ Insulator
- ④ Cover Plate
- ⑤ Oil Filling Plug
- ⑥ EMU Tank
- ⑦ Oil Level Glass
- ⑧ Oil Drain Plug
- ⑨ Lifting Lugs
- ⑩ Earthing Clamps for Conductor (2pcs)
- ⑪ Secondary Terminal Box
- ⑫ Removable Undrilled Gland Plate
- ⑬ Center of Gravity

HV-Voltage Transformer		Type: CPA - CPB					
Highest System Voltage	Um (kV)	72.5	145	245	420	550	800
Insulation Level	BIL (kV)	140 - 325	275 - 650	460 - 1050	630 - 1050 - 1425	680 - 1175 - 1550	975 - 1550 - 2100
Rated Primary Voltage	Un (kV)	$63 / \sqrt{3}$	$132 / \sqrt{3}$	$230 / \sqrt{3}$	$400 - 500 / \sqrt{3}$		$765 / \sqrt{3}$
Rated Secondary Voltage	Usn (V)	$100 / \sqrt{3}$, $110 / \sqrt{3}$, $100/3$ or $110/3$					
Rated Secondary Burden	VA	Up to 2 * 200					
Number of Secondary Windings	-	Up to 3					
Class	-	3P , 0.2 , 0.5					
Rated Frequency	F (Hz)	50 / 60					
Min. Capacitance	Ctot (pF)	23800	12700	11600	7300	3400	
Creepage Distance	mm / kV	Up to 31					

(Note) Special designs can be offered based on customer's request.

Generator Circuit-Breaker (GCB) Type: HEC 3

The Generator Circuit-Breaker System HEC 3 is produced in Nirou Trans Company under license of ABB Switzerland.

The Generator Circuit-Breaker System HEC 3 has been developed as a system suitable for application in all types of power plants. It is also suitable for retrofitting existing power plants, when these are modernised, extended and/or automated. It is available for both indoor and outdoor application.

Generator Circuit-Breakers are connected between generator and step-up voltage transformers. They are generally used at the outlet of high power generators in order to protect them in a reliable, fast and economic manner.

Some advantages of Generator Circuit-Breakers are as follows:

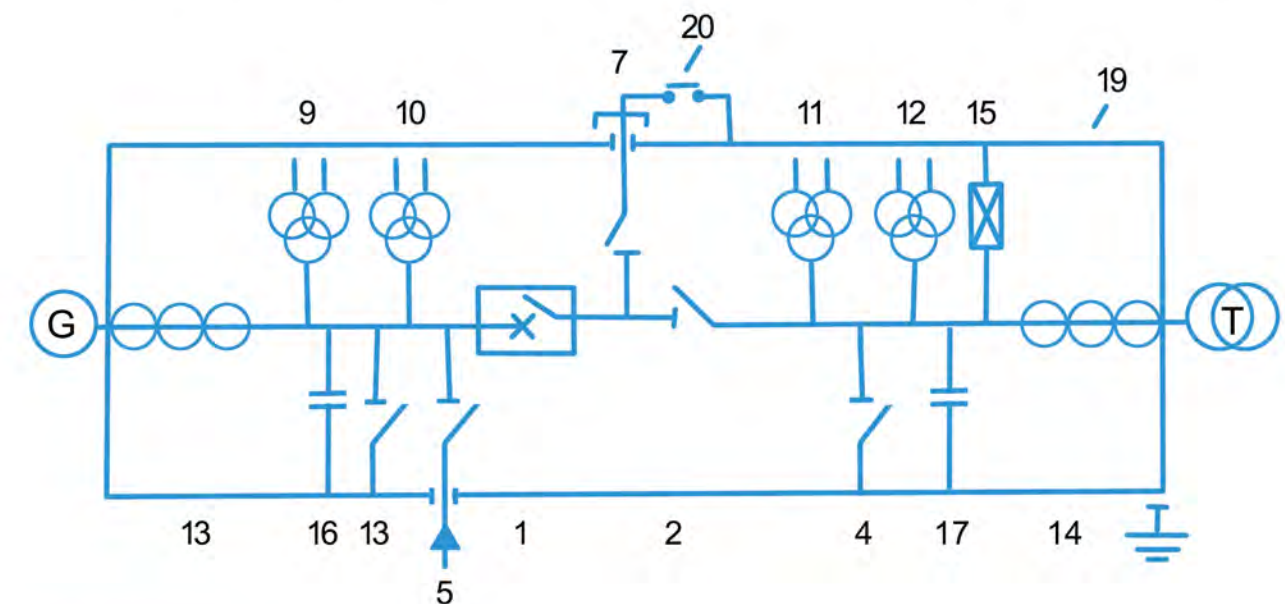
- Simplification of Operation Procedures
- Improved Protection of the Generator and the Main and Unit Transformers
- Increased Safety
- Higher Power Plant Availability



The Schematic Diagram of a GCB

1. Generator Circuit-Breaker
2. Disconnecter
- 3,4. Earthing Switches
5. Starting Switch for Gas Turbines
7. Braking Switch or Manual Short-Circuiting Connection
- 9-12. Voltage Transformers
- 13,14. Current Transformers
15. Surge Arrester
- 16,17. Surge Capacitors
19. System Enclosure
20. Earthing Link

Note 9,10: On request a third voltage transformer can be foreseen on the generator side.



Technical Data

Generator Circuit-Breaker		Type: HEC 3	
Rated maximum voltage		25.3	kV
Rated frequency		50/60	Hz
Rated continuous current	50Hz	12	kA,rms
Rated continuous current	60Hz	11.5	kA,rms

Condenser Bushings 72.5-420 kV

Bushings are one of the most important parts of transformers. In each 3-phase transformer, depending on the ratio, at least 7 bushings are used. In voltage levels above 72.5 kV, only condenser bushings are used because of the need for optimum dimensional design. We are capable to design and manufacture condenser bushings up to 420 kV with one of the most up-to-date technology (OIP). In OIP (Oil Impregnated Paper) kraft paper supplied by most valid and well-known suppliers is used. This type of bushings can conduct high voltage electricity from air to oil.



Type	Highest System Voltage (kV)	Rated Current (A)	CT Extension (mm)	Rated Frequency (Hz)	
NGB1	72.5	1250	0	50/60	
			300		
	100	1250	0		
			300		
			2000		0
			300		
	145	1250	0		
			300		
			500		
			2000		300
170	2000	500			
		300			
OTF	245	1600	400		
			600		

(Note) Special designs can be offered based on customer's request.

Wall Bushing Type: NGB2

Wall bushing is an equipment used to conduct current at high voltage through a wall or framework. Since both sides are exposed to air, it is also called air to air bushing. The main application of wall bushing is in power plants and indoor substations for passing high voltage conductor through walls.

Some of the features of wall bushings made by Nirou Trans are as follows:

- Excellent electrical withstand capability
- Sufficient mechanical strength
- Low thermal stress
- Installation in any angle
- Large creepage distance
- Sufficient flashover distance
- Economic price



Specification of NGB2

Type	Um (kV)	Ir (A)	AC Dry Test (kV)	Li Test (kV)	Arcing Distance (mm)	Permissible Altitude (m)	Creepage Distance (mm)	Creepage Distance (mm/ kV)
NGB2	72/5	1250	140	325	680	2700	2384	33
	100	1250	185	450	900	5000	2725	38
	145	1250	275	650	1410	2950	5004	35
	170	1250	325	750	1550	3750	5780	40

(Note) Special designs can be offered based on customer's request.

Medium Voltage Instrument Transformers Up to 36kV



Various types of medium voltage epoxy resin (dry type) instrument transformers are manufactured according to IEC/IEEE and other international standards.

The products are suitable for indoor and outdoor installation. Window type instrument transformers up to 20000A and inner diameter up to 1200mm are designed and manufactured in Nirou Trans Company.



Voltage Transformer		Type: 4VPA , 4VPA1, VPV , VPV1, GUPT , TIPT		
Highest System Voltage	Um (kV)	12	24	36
Insulation Level	BIL (kV)	28-75	50-125	70-170
Rated Primary Voltage	Un (kV)	11,11/√3	20,20/√3	33,33/√3
Rated Secondary Voltage	Usn (V)	100/√3 or 110/√3 or 100 or 110		
Rated Secondary Burden	VA	Up to 100		
Number of Secondary Windings	-	Up to 3		
Class	-	3P , 0.2 , 0.5		
Rated Frequency	F (Hz)	50 / 60		
Installation	-	Indoor or Outdoor		

(Note) Special designs can be offered based on customer's request.

Current Transformer		Type: INA , UNA , NICT , APE , AGE		
Highest System Voltage	Um (kV)	12	24	36
Insulation Level	BIL (kV)	28-75	50-125	70-170
Rated Primary Current	Ipn (A)	Up to 3000		
Rated Secondary Current	I _{sn} (A)	1 or 5		
Rated Primary Thermal Current	I _{th} (kA)	Up to 40		
Number of Cores	-	Up to 4		
Class	-	5P , 10P , X , 0.2 , 0.5 , 0.2S , 0.5S		
Rated Frequency	F (Hz)	50 / 60		
Installation	-	Indoor or Outdoor		

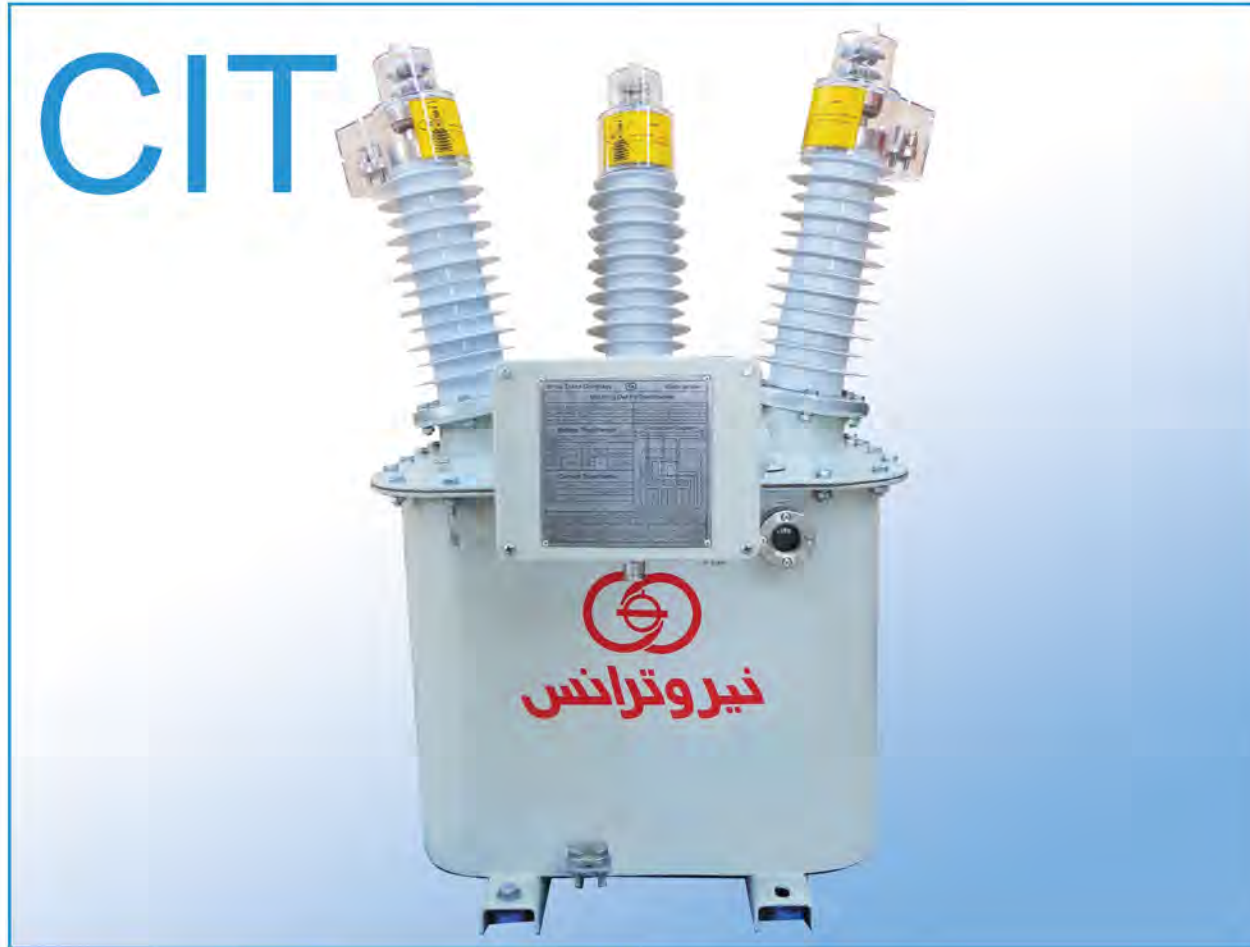
(Note) Special designs can be offered based on customer's request.

Window Type Current Transformer		Type: BCT , WML , WHL , WRL		
Highest System Voltage	Um (kV)	0.72 (Max 1.2)		
Insulation Level	BIL (kV)	3 (Max 6)		
Rated Primary Current	Ipn (A)	Up to 20000		
Rated Secondary Current	I _{sn} (A)	1 , 2 , 5		
Rated Primary Thermal Current	I _{th} (kA)	Up to 100		
Class	-	5P , 10P , X , 0.2 , 0.5		
Rated Frequency	F (Hz)	50 / 60		
Installation	-	Indoor or Outdoor		
Type of Primary	-	Cable		

(Note) Special designs can be offered based on customer's request.

Combined Instrument Transformers (CIT) Up to 36kV

This instrument transformer consists of three units of current transformers and also two double phase voltage transformers. It is designed to measure the three phase current and the phase to phase voltage simultaneously. All of the CT/PT modules are enclosed in one galvanized housing which is filled with oil and hermetically sealed.



Combined Instrument Transformer (CIT)				
Highest System Voltage	Um (kV)	12	24	36
Insulation Level	BIL (kV)	28-60	50-125	70-170
Rated Primary Voltage	Un (kV)	11	20	33
Rated Secondary Voltage	Usn (V)	100	100	110
Rated Secondary Burden	VA		30	
Rated Primary Current	Ipn (A)		Up to 300	
Rated Secondary Current	Isn (A)		5	
Class	-		0.5	
Rated Frequency	F (Hz)		50	
Installation	-		Indoor or Outdoor	

(Note) Special designs can be offered based on customer's request.

High Voltage Power Factor Correction Capacitor (KLV)

The technology and know-how of designing, manufacturing and testing of power factor correction capacitors are received from Iskra Slovenia.

Advanced technology of KLV capacitors is based on construction of all-film capacitor sections, folding foil edge design, improved electrical and mechanical connections between sections and environmentally impregnation with compatible insulating oil. KLV capacitors have very low dielectric losses and are designed for long service life.



Power Factor Correction Capacitor Type: KLV1				
Highest System Voltage	Um (kV)	12	24	36
Insulation Level	BIL (kV)	28-75	50-125	N/A
Rated Voltage of Capacitor (Phase to earth)	Un (kV)	2-20		
Rated Power	Qn (KVAR)	Up to 600		
Rated Frequency	F (Hz)	50 / 60		
Losses Total	W/KVAR	< 0.15		
Max Permissible Current Continuously	-	1.3 In		
Max Permissible Voltage Continuously, 12 hours Per day	-	1.1 Un		
Fuse	-	Internal (If requested)		
Discharge Resistor	-	According to design		

(Note) Special designs can be offered based on customer's request.

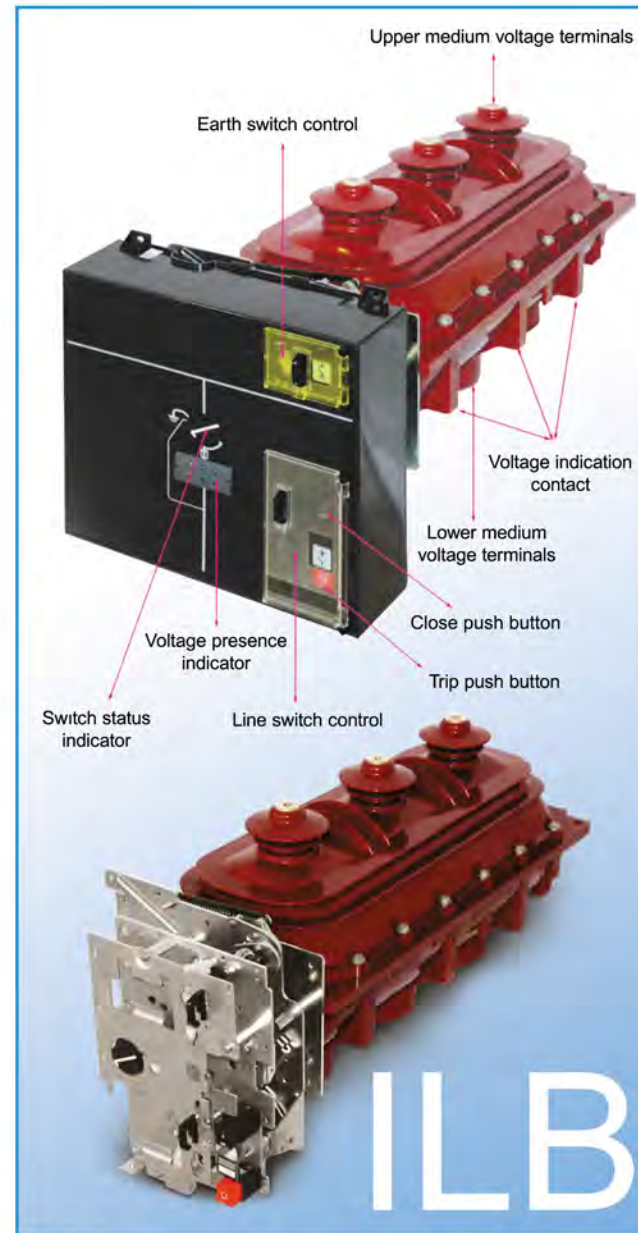
Iranian Load Breaker (ILB)

The ILB switching apparatuses consist of gas insulated switch disconnectors and isolators, suitable for medium voltage metal-enclosed switchgear. They are used in medium voltage panels for supplying lines, power transformers and ring networks.

Due to its size, ILB can be installed in panels 375 mm in width or wider. The enclosure of the ILB consists of two half-shells, made of epoxy resin, a set of three top insulators and a set of three bottom insulators made of epoxy resin, and a front operating mechanism.

The moving contacts for isolation, breaking, closing and earthing are arranged inside the enclosure in SF6 gas.

The unit is sealed complying with the IEC 60694 standards. The three top insulators make it possible to fix the main busbars and the three bottom insulators allow connection of the cables.



ILB General Characteristics		Value
Rated Voltage	kV	24
Switch Rated Current	A	630
Switch Short Circuit Current	kA/1 s	20
Disconnecter Rated Current	A	630
Disconnecter Short Circuit Current	kA/1 s	20

Other Resin Parts

PLUG-IN BUSHING



CAPACITIVE INSULATOR



WALL-THROUGH BUSHING



RESIN PARTS

VOLTAGE INDICATOR



SPOUT





Factory: Etehad Blvd., Sharif Abad Sq., Shiraz-IRAN
Tel: +98-71-37438659 - 37439210-14
Fax: +98-71-37438691 , P.O.Box: 71555-141
Email: sales@niroutrans.com

Tehran Office: No1206, Sarv-e-Saee Building, Vali Asr Ave., Tehran-IRAN
Tel: +98-21-88701414
Fax: +98-21-88701415 , P.O.Box: 14335-899

www.niroutrans.com