



Mining medium voltage switchgear system



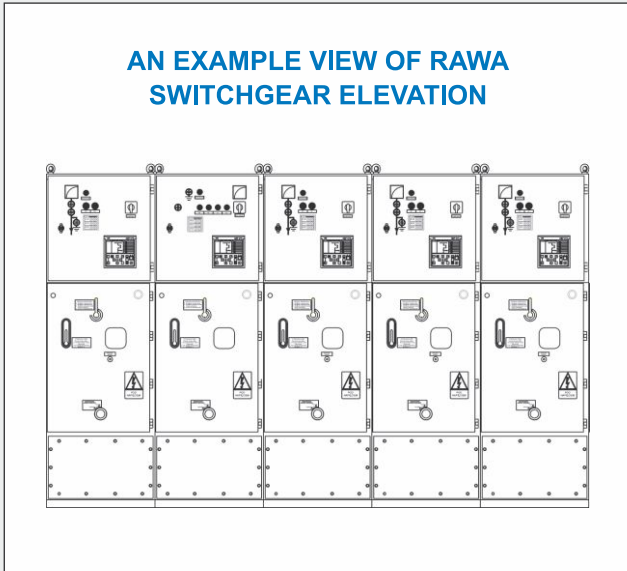
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Mining medium voltage switchgear system

The RAWA switchgear is designed for supply and distribution of AC three-phase electric energy with a rated frequency 50Hz and rated voltage up to 12kV in mine electric power networks.

AN EXAMPLE VIEW OF RAWA SWITCHGEAR ELEVATION



The RAWA switchgear is:

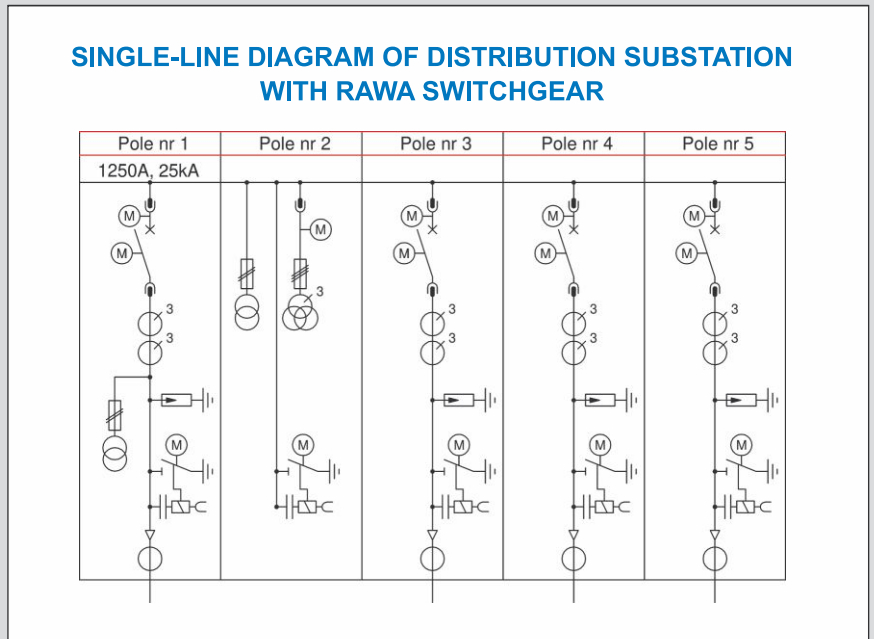
- especially for mining industry and polluted areas
- indoor
- air insulation
- metal clad
- internal decompression of arc gases
- blow-out of gases limited to decompression chamber only
- truck-mounted design with draw-out circuit breaker
- free-standing
- compartments separated with metallic partitions
- single busbar system
- degree of protection IP 54
- arc-proof
- operational safety for staff
- modern
- equipped with modern switching apparatus
- type-tested and approved for use in underground of mines (certificate issued by the Polish **State Mining Authority**)

Advanced engineering solutions of RAWA switchgear combined with modern electrical apparatus of leading international manufacturers ensure its safe and easy operation and maintenance.

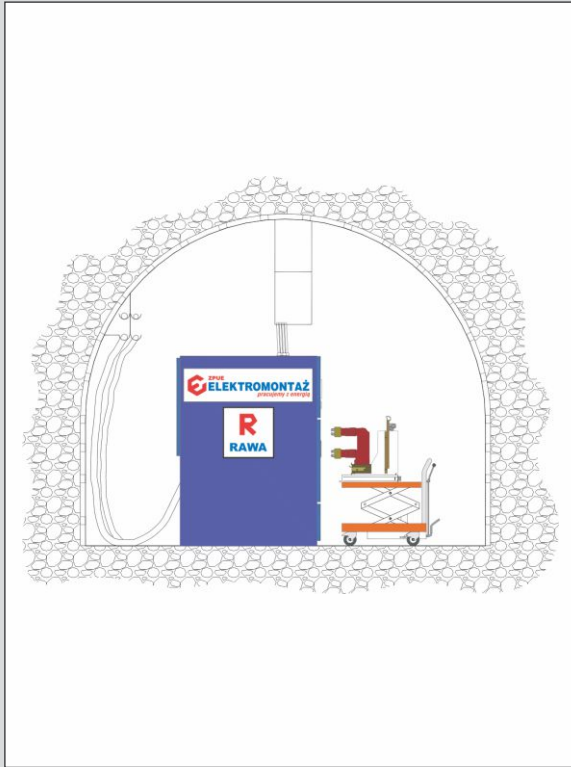
Advantages of RAWA switchgear:

- unique and innovative constructional solutions
- high resistance to electric arc
- various switchgear system configurations possible
- high operational safety and reliability
- high resistance to corrosion
- ease of cable termination and connection
- compact overall dimensions

SINGLE-LINE DIAGRAM OF DISTRIBUTION SUBSTATION WITH RAWA SWITCHGEAR



Main features



- The RAWA switchgear has been approved by the Polish State Mining Authority to be used underground in mines.
- Cubicles are equipped with modern switching, measuring and control equipment.
- The equipment of the switchgear's single cubicle depends on its function in the switchgear's configuration.
- Variety of basic cubicles gives possibility of designing any configuration of the switchgear.
- The cubicles are metal clad, i.e. the three functional compartments for busbars, switching apparatus and cable connection are separated from each other by metal partitions. In addition, the low voltage compartment is also metal clad.
- Construction of metal sheets covered by zinc or aluminum-zinc coating.
- Doors, external covers are finished with powdered varnish in colour adjusted to the Customer requirements.
- The construction of cubicles is properly reinforced to ensure high resistance to internal electric arc.
- The closed door provides full protection against internal arc, all compartments of the cubicle are connected with the internal decompression chamber by the special blow-out valves which in fault conditions open under pressure of gases generated during electric arc and ensure blow-out of gases to the a.m. decompression chamber.
- System of electrical and mechanical interlocks which prevents the erroneous operations.

List of basic equipment

No.	Apparatus	Type	Manufacturer
1	Circuit breakers	VD4	ABB
2	Contactors	V-Contact, ConVac	ABB
3	Earthing switches	E	ABB
4	Current transformers	TPU	ABB
		ACI	ARTECHE
		CTS	KPB Intra
		AB / ATB	ALCE / ESITAS
5	Voltage transformers	TJP, TJC	ABB
		UCI, UCIF, VCT	ARTECHE
		VTS	KPB Intra
		VB / VTB	ALCE / ESITAS
6	Earth fault instrument transformers	IO	SPIE Energotest
		IO-1s, IFW, KOKM, KOLMA	ABB
		CTR1	KPB Intra
7	Surge arresters	POLIM	Hitachi Energy
		ASM, ASW	Apator
		3EK	Siemens
		Proxar	Protektel
8	Protection Relays	REF	ABB
		MICOM	Schneider Electric
		Ex-BEL	Apator

* other equipment to be agreed



RAWA / RAWA PRO - Mining medium voltage switchgear system

Technical data:

		RAWA	RAWA PRO
Rated insulation voltage	kV	12	12
Rated lightning impulse withstand voltage (1.2/50µs)	kV	75/85	75/85
Rated power frequency withstand voltage	kV	28/32	28/32
Rated frequency	Hz	50	50
Rated continuous current	A	up to 1600	up to 1250
Rated short time withstand current	kA	up to 31,5/3s	up to 25/3s
Rated peak withstand current	kA	up to 80	up to 63
Withstand for internal arcing fault	kA	25/1s	25/1s
Degree of protection		IP 54	IP 54
Busbar system		single	single
IAC classification (class of resistance to internal arc)		AFLR	AFLR
PM/PI classification (class of partitions)		PM	PM
LSC classification (class of compartment accessibility)		LSC2B	LSC2B
Weight of a single switchgear cubicle		kg	350 - 900
Overall dimensions	Width	mm	600 - 750
	Depth	mm	1370
	Height	mm	1950

Certificate of compliance with the standards PN-EN 62271...
State Mining Authority in Katowice.

Switchgear RAWA are designed for work in mining, underground power networks.

They can work as:

- underground switchgear, mine
- underground switchgear, branch

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