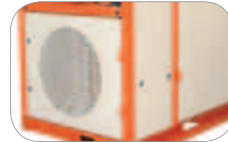




MINING EQUIPMENT



## COMPRESSOR UNITS



## VISION

Grupa APATOR –Leader in Eastern and Central Europe for metering equipment and systems and switchgear equipment.

## MISION

Our challenge is to produce high technology managing efficiently any kind of energy.

Safety of our Customers and care about the environment are determinants in our action.

## STRATEGIC OBJECTIVE OF GRUPA APATOR

is to establish the Polish technological group based on a strong brand of Apator oriented at the increase of sales on foreign markets.

## AREAS OF OPERATION

### „FROM METERING TO DATA MANAGEMENT”

The companies in Grupa APATOR are manufacturers of metering equipment and they are integrators of the systems. Grupa APATOR presents the comprehensive offer and service for metering and reading of all utility services.

Our metering systems make easy to manage the consumption of electricity, heat, water and gas by consumers. The application of metering systems allows reducing the expenditures on consumption of water, electricity, gas and heat. Therefore, our world becomes clearer, healthier and friendlier for the future generations. High tech metering equipment is favourable to the persons who like to have control over their expenditures. In that area we offer: electricity meters, water meters, heat meters, gas meters, sensors, IT systems, our system solutions.

### „ENERGY SAFETY CONNECTED”

The highest quality of our switchgear equipment allows for safe breaking, making and protecting of power networks in such a manner that consumers and distributors of energy will not be afraid of power cut off.

In that area we offer: surge arresters, switchgear equipment, mining and intrinsically safe equipment, switchboards, and industrial automatics.





*Apator Mining Sp. z o.o was established on December 7, 1995 in Katowice under the name of Apator Service Sp. z o.o. Initially the company was involved in provision of overhaul and repair services for the mining products manufactured by Apator S.A.*

*Most important events for the Company:*

- **April 1997** - Taking over Fabryka Specjalnych Maszyn Elektrycznych i Urządzeń Technologicznych EMA-KOMEL (Special Electrical Machines and Technological Equipment Factory) - the manufacturer of DC motors
- **June 2001** - The commencement of explosion-proof equipment manufacturing based on own design documentation and license agreement concluded with Apator S.A.
- **December 2001** - Taking over PRUG AIR, a leader in Polish market in manufacturing explosion-proof compressors
- **September 2002** - Purchase of Zakład Elektroniki Przemysłowej „ELWEX” (Industrial Electronics Company), the manufacturer of explosion-proof equipment of industrial automation systems
- **June 2003** - Implementation of a Quality Management System in accordance with ISO 9001:2000
- **September 2004** - The change of the company name to Apator Mining Sp. z o.o.
- **December 2006** - Implementation of integrated Management System in accordance with ISO 9001:2000, ISO 14001:2004



#### PRODUCTION

- Flame-proof contactor starters
- Flame-proof transformer units
- Explosion-proof rotary screw compressors
- Sensors and control system components
- Solenoid releases
- Explosion-proof accessories

#### SERVICES

- Overhaul and repair of explosion-proof electrical equipment and compressors
- Screw compressor leasing
- Design and technical consultancy
- Training in construction, operation and maintenance of the manufactured equipment
- Management of compressed air including:
  - Energy audit
  - Design of compressor stations and blower stations
  - Compressed air outsourcing
  - Design and construction of control systems of compressed air networks
  - Delivery, installation and starting the equipment
  - Full servicing



## Compressor units type PAS-\*\* and PAS-\*\*-W

### APPLICATION

The compressor units type PAS-\*\* and PAS-\*\*-W meet the requirements of the EU Directive 94/9/EC (ATEX) for the equipment in group I and category M2, and can be used in mine underground pits endangered with methane and coal dust explosion. The compressor units type PAS-\*\*-W, as distinct from our compressors type PAS-\*\*, are totally water-cooled and can be used in worse ventilated areas or at considerable depths in mines where keeping good climate conditions, compliant with the valid regulations, creates a problem for ventilation personnel. In comparison with the compressors type PAS-\*\*, the water-cooled compressor units PAS-\*\*-W are characterized by the following features:

- lower heat emission to direct environment;
- closed circuit cooling water from fire-fighting pipelines or air conditioning units;
- lower noise emission levels;
- lower dimensions;
- lower weight.

All our compressor units type PAS-\*\* and PAS-\*\*-W are designed for local supplying the compressed air operated equipment, pipelines as well as an air and water sprinkling system for heading machines.

### DESIGN

The construction of the compressor units type PAS-\*\* and PAS-\*\*-W is based on a screw compressor assembly. The units are air-cooled, and in the case of installation in the locations with poor ventilation or high ambient temperatures, the units can be equipped with an additional water-cooled oil cooler that uses water from fire-fighting pipeline. The units are located in the strong container-like housing equipped with skids and handles for all transport types. The compressors type PAS-\*\* and PAS-\*\*-W are 1000 mm wide as maximum, which facilitates transport and machine placement in mine drifts.

The units are equipped with the automatic control systems to ensure safe operation without the necessity of permanent operator control. The compressor unit is controlled by means of the starter type RGS being its integral part. The RGS starters are equipped with safety mechanisms protecting them against: excessive temperature rise in motor windings, short-circuits, overloads, current and voltage asymmetries, excessive symmetrical supply voltage drops, incorrect phase sequence and excessive insulation resistance decrease.

The units are also equipped with the „unload/load“ pumping pressure stabilization system.



The construction of the pressure stabilization system is based on a pressure switch where upper and lower compressor pumping pressure thresholds are set. The „unload/load“ system operation provides:

- closing air intake at the compressor suction when the upper pumping pressure threshold is reached – switching to idle running,
- switching off the compressor driving motor after the set time during idle running when the pumping pressure does not drop below the lower pressure threshold,
- opening air intake at the compressor suction or automatic start of the compressor driving motor (depending on the operation status) when pressure drops below the lower threshold.

Moreover, the units are equipped with the protections against excessive oil and compressed air temperature rise, oil and air filter contamination indicators, a manometer for measuring oil separator contamination levels and an active self-service fire fighting line.

The units are compatible with the systems used for transmitting the compressor operation data e.g. to a mine ground level.

## TECHNICAL DATA

Model	PAS-22	PAS-55	PAS-75	PAS-90	PAS-110/A	PAS-75-W	PAS-90-W
Maximum pumping pressure	0,75 MPa	according to varieties table	0,75 MPa				
Performance	3,4 m <sup>3</sup> /min	according to varieties table	12,2 m <sup>3</sup> /min	14,4 m <sup>3</sup> /min	18,1 m <sup>3</sup> /min	12 m <sup>3</sup> /min	14,2 m <sup>3</sup> /min
Power voltage *	500 V, 1000 V, 50 Hz						
Nominal power	22 kW	55 kW	75 kW	90 kW	110 kW	75 kW	90 kW
Ambient temperature	3 ÷ 40 °C						
Parameters of water supply system for additional water-cooled oil cooler							
maximum pressure	2,0 MPa					1,0 MPa	
minimum flow	up to 15 l/min		up to 20 l/min				
Factory settings for "load on/load off" pressure stabilization system							
pressure switch - low threshold	0,65 MPa						
pressure switch - high threshold	0,40 MPa						
operation time in neutral gear	60 s						
lock-up time after turning the motor off	60 s						
Compressed air network connection	G 1 1/2"		G 2"				
Dimensions(L x W x H)	2150 x 760 x 900 mm	2350 x 900 x 1250 mm	2550 x 900 x 1450 mm	2700 x 1000 x 1450 mm	2250 x 900 x 1450 mm		
Weight	900 kg	2350 kg	2650 kg	2750 kg	2000 kg	2050 kg	
Oil content	3 mg/m <sup>3</sup>						
Cooling mode	air or water					water	
Marking of the appliance	CE 1453 IM2 EExd[ia/ib] I				CE 1453 IM2 Exd[ia]I		CE 1453 IM2 Exd[iaib]I
Certificate number	OBAC 06ATEX033X	OBAC 06ATEX225X	OBAC 05ATEX227X	OBAC 05ATEX228X	OBAC 08ATEX435X	OBAC 07ATEX262X	

\* optional power voltages are available as per client's request

## VARIETIES TABLE EXPLOSION-PROOF COMPRESSOR UNITS TYPE PAS-55

Variety	Performance	Maximum pumping pressure
1	9,73 m <sup>3</sup> /min	0,60 MPa
2	9,20 m <sup>3</sup> /min	0,70 MPa
<b>3</b>	<b>8,72 m<sup>3</sup>/min</b>	<b>0,75 MPa</b>
4	7,40 m <sup>3</sup> /min	1,00 MPa
5	6,64 m <sup>3</sup> /min	1,20 MPa
6	6,00 m <sup>3</sup> /min	1,40 MPa

## Compressor units type PAS-\*\* and PAS-\*\*-W

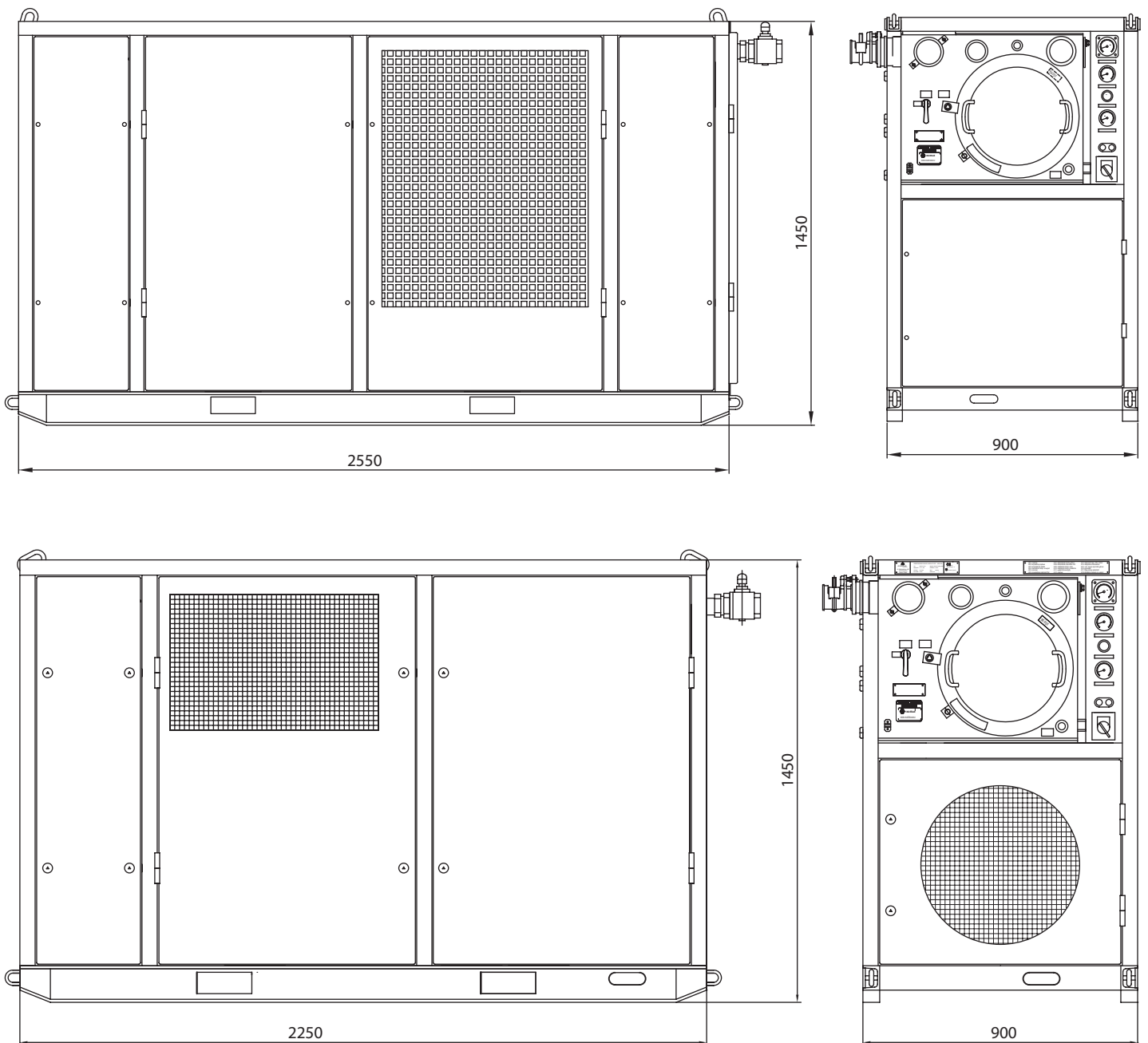
### WORKMANSHIP

The PAS-55, PAS-75, PAS-90 and PAS-\*\*-W units are designed to allow for 500 or 1000 [V] connections via external changeovers. The PAS-22 units are manufactured as 500 or 1000[V] power voltage network compatible model types without the external changeover option. Optionally, the units may also be fitted with:

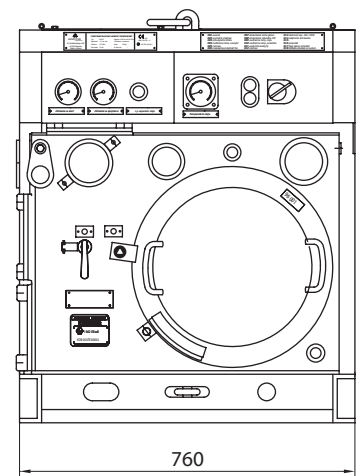
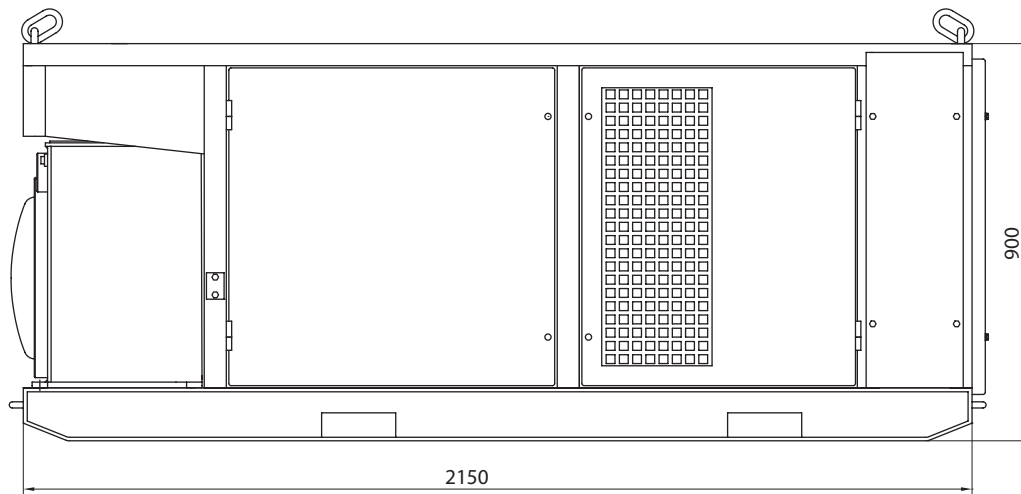
- additional water-cooled oil cooler with water flow indicator,
- electrical water shut-off valve for additional water-cooled oil cooler,
- modules allowing for data transmission system connections,

### DIMENSION DRAWING

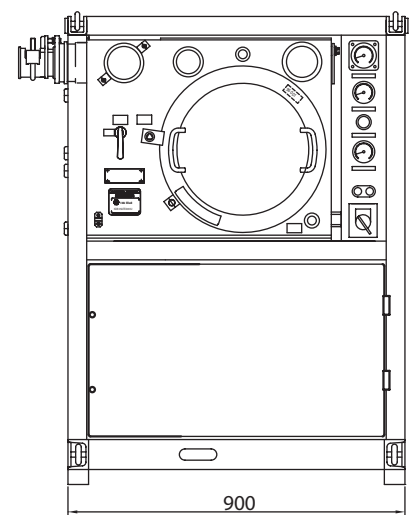
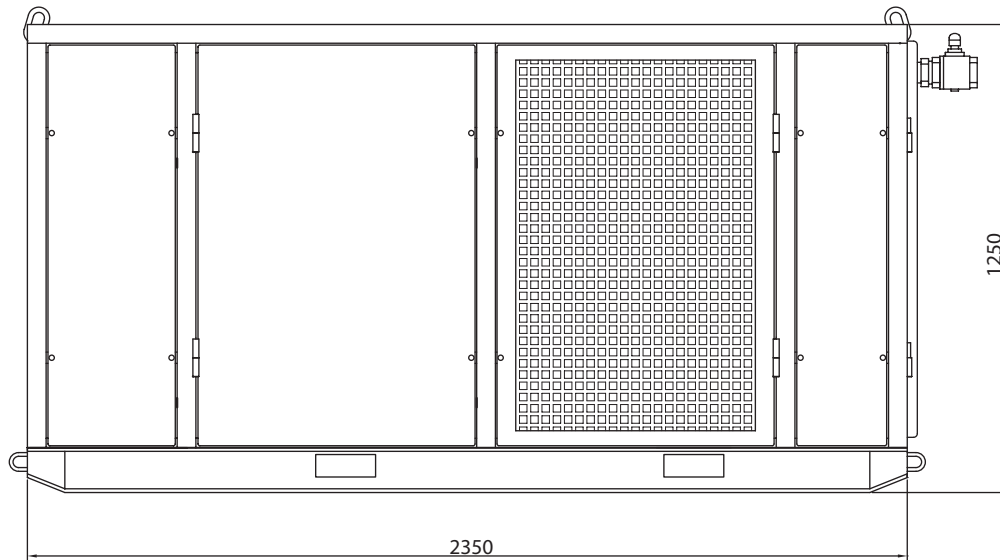
#### PAS-75, PAS-90 PAS-75-W, PAS-90-W



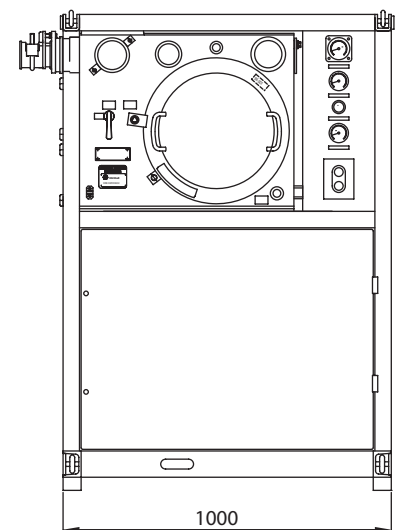
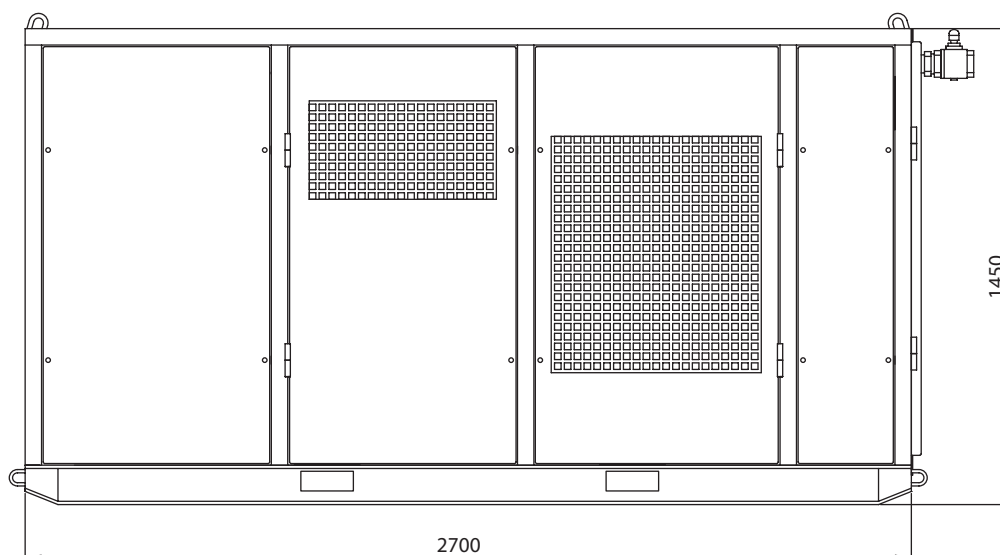
**PAS-22**

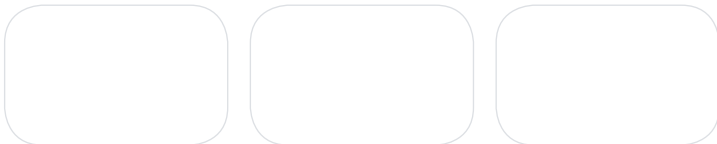
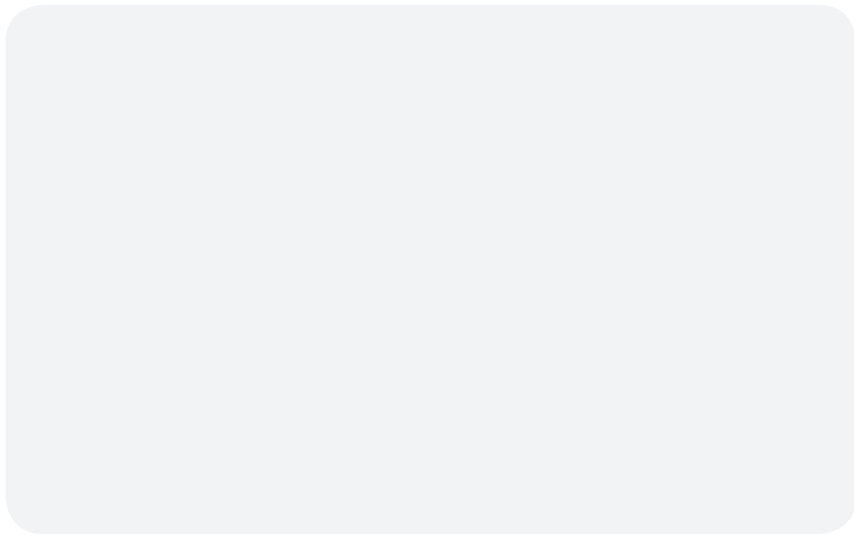


**PAS-55**



**PAS-110**





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