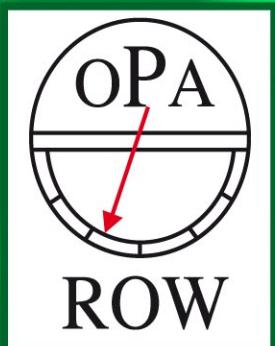
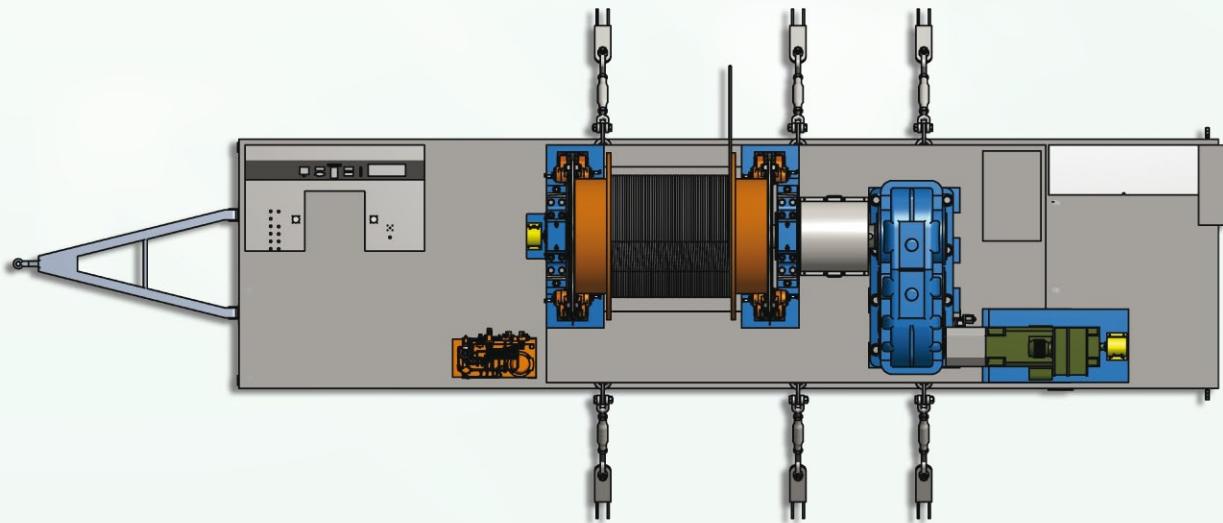
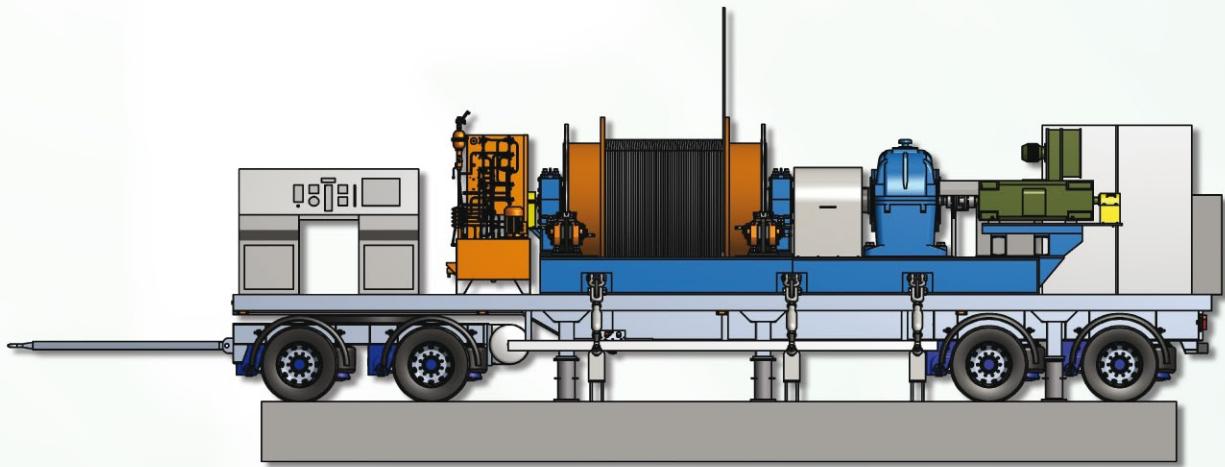


MOBILE HOIST FOR THE USE IN THE MINING SHAFT



MOBILE WINDER MEETS THE FOLLOWING PARAMETERS:

• rope speed	2 m/s
• maximum force in the rope	50 kN
• depth of pulling	1500 m
• power supply	3x500 VAC
• electric motor type	DC
• motor power	115 kW
• motor speed	1000 rpm
• type of DC motor control	regenerative thyristor converter
• brake	hydraulic with two brake discs
• grooved drum liner	4 pairs of BSFI 360 brakes Lebus type with the groove for rope diameter 22mm



A GENERAL DESCRIPTION

Mobile winder produced by our company can be used as auxiliary hoist in the mining shafts as:

- inspection hoist
- emergency evacuation hoist
- hoist for people and material transportation
- hoist for shaft equipment repair and as the shaft hoist used for shaft sinking and building.



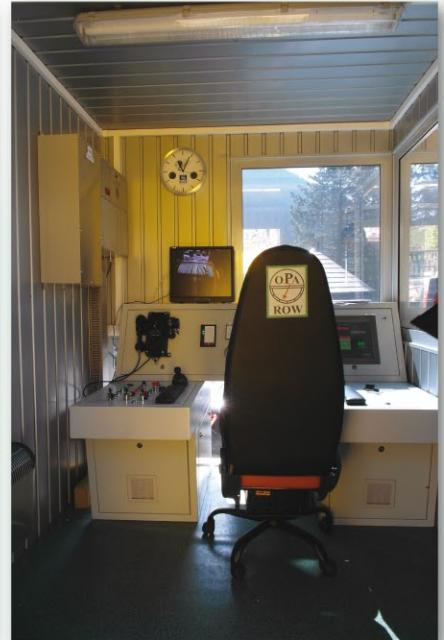
Winder has protected against atmospheric conditions by trailer body.
Mobile winder is designed to use in the atmosphere not risked by explosive gases and dusts but can operate in potentially explosives zones of mining shafts.

Trailer body is divided into two compartment:

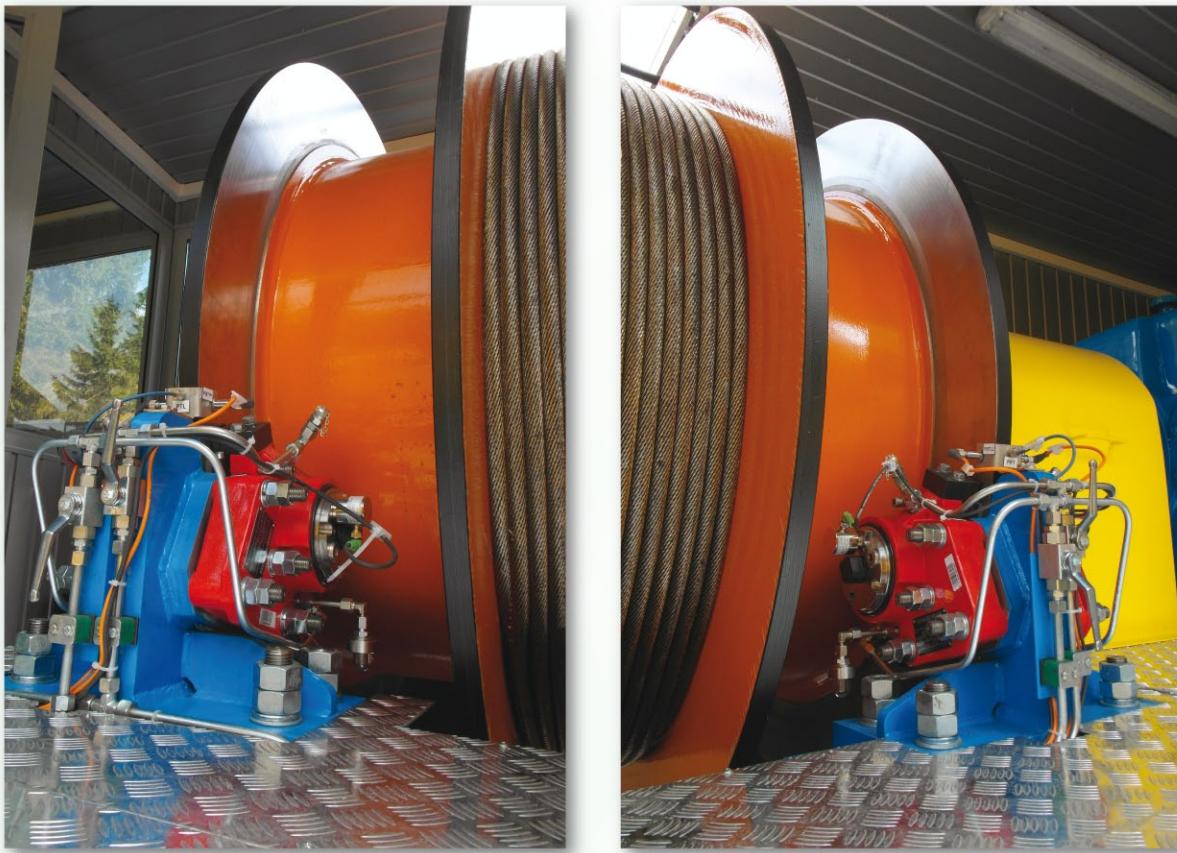
- main equipment compartment when placed main winder elements like: rope drum, gearbox, drive motor, brakes, electric control cabinet. Main equipment compartment can be heated or cooled depending on external temperature. Trailer has equipped with adjustable covers to allow adjust it to rope angle.



- operators cab, equipped with an ergonomic control panel with operator's seat, a additional device for manual emergency braking, elements of visualization, control, communications, shaft signaling, etc. . The cab is air conditioned and heated.



Winder is designed to pull cage to maximum depth of 1500m (more available for other rope parameters). Rope drum has equipped with two brake discs. Four pairs of hydraulic fail-safe brake BSFI 360-S-200 type has placed on the four brake stands.

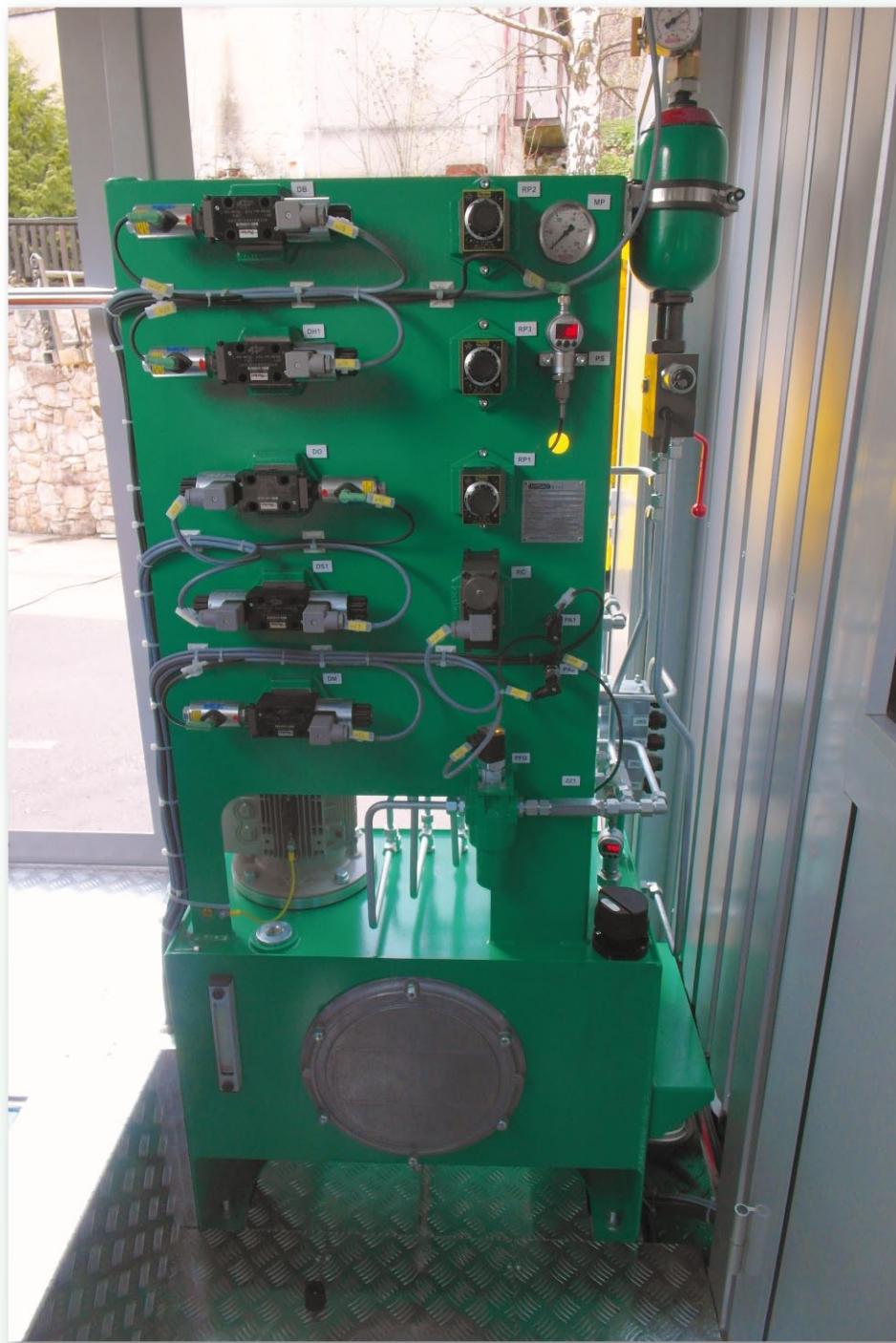


The four axle trailer allowing easy movement of mobile winder on the roads.



The hydraulic brake control unit:

- has oil tank with a volume of 100 dm³ with a stability of hydraulic oil temperature,
- a pipe system between brake calipers and hydraulic control unit allows oil flow across them for thermal stability,
- has two control subsystems: one for normal braking, and the other, independent subsystem for the emergency braking,
- the normal braking subsystem that ensures smooth control of the braking force in full force range,
- the emergency braking system has two adjustable, different braking forces depending on the direction of cage movement for adjusting hoist deceleration,



Electric DC drive of winder use 3x500VAC electric supply, connected through a fuse-disconnector. The control system meets the following requirements:

- regulation and control system security has been built entirely on the basis of freely programmable controllers without the use of relays,
- brake control system procedures and a digital drive controller are powered by DC voltage from battery backup power systems for each driver,
- microprocessor control cabinet is realizing all safety, regulation and control functions of winder, hydraulic brake systems, drive, power supply and shaft signalling,
- driver procedures for implementing a digital drive controller does not lose information about the depth of the cage, even in case of loss of power,
- drivers utility used to create a program in ladder logic with a description of all structures designed similarly to the conventional electrical schematic.

Software tools can observe parts of the program together with the names of program variables and their values, and descriptive comments,

- each drive is provided with program to configure and viewing on-line parameters of the digital drive,
- shaft signalling system is integrated with the control and security control winder.



The control panel of hoisting machine is equipped:

- control panel has equipped with bargraph depth indicator with a resolution of at least 2% of total operating depth and digital depth indicator with a resolution of at least 0.1 m,
- control panel has equipped with two joystick for speed and braking pressure control with optical transducers,
- visualization and recording system to ensure diagnosis of faults occurring in both the hardware and software with at least 15" LCD touchscreen.

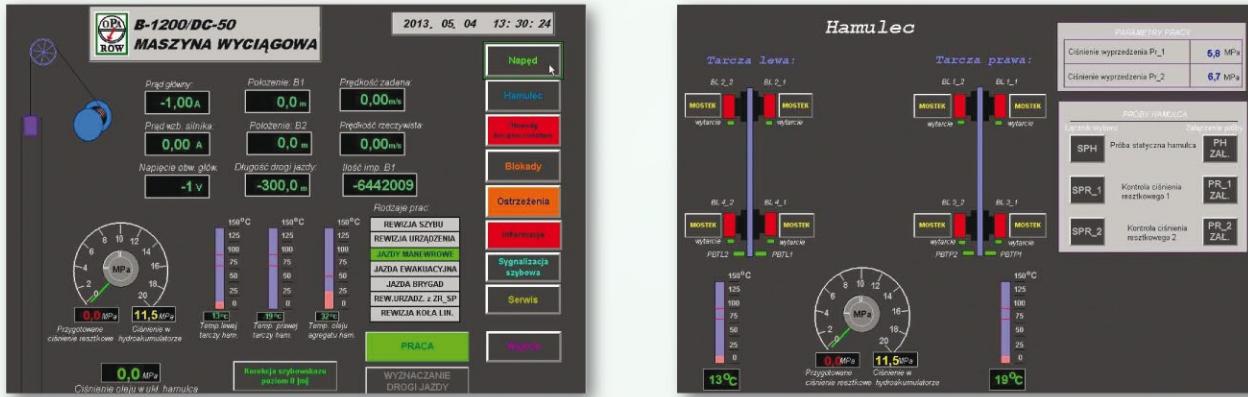


To allow the operator to observe the drum in the main equipment compartment, placed is the camera, from which the signal is displayed on the monitor, located in the operator's cab.



Visualization and recording system used in the winder allows recording and presentation in the graphic form:

- the state of physical and virtual components as brake elements, shaft signalling and other equipment related to lift shaft,
- status of all physical and virtual digital safety features, single items, adjustments and initiating safety and interlock circuits,
- analog physical variables such as:
 - rope's speed to the nearest 0.1 m / s,
 - cage's position in the shaft,
 - the pressure in the brake system,
 - motor's current,
 - other physical variables according to needs.
- acoustic signals from the shaft signaling, buzzer alarm signals and digital signals.

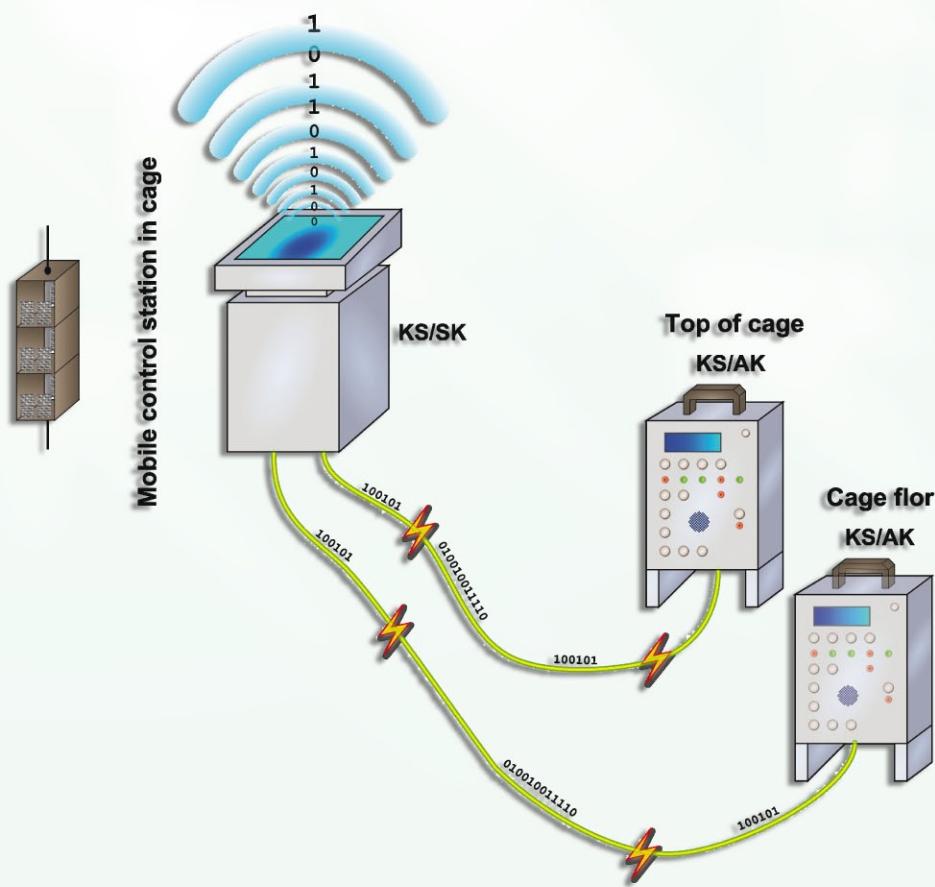
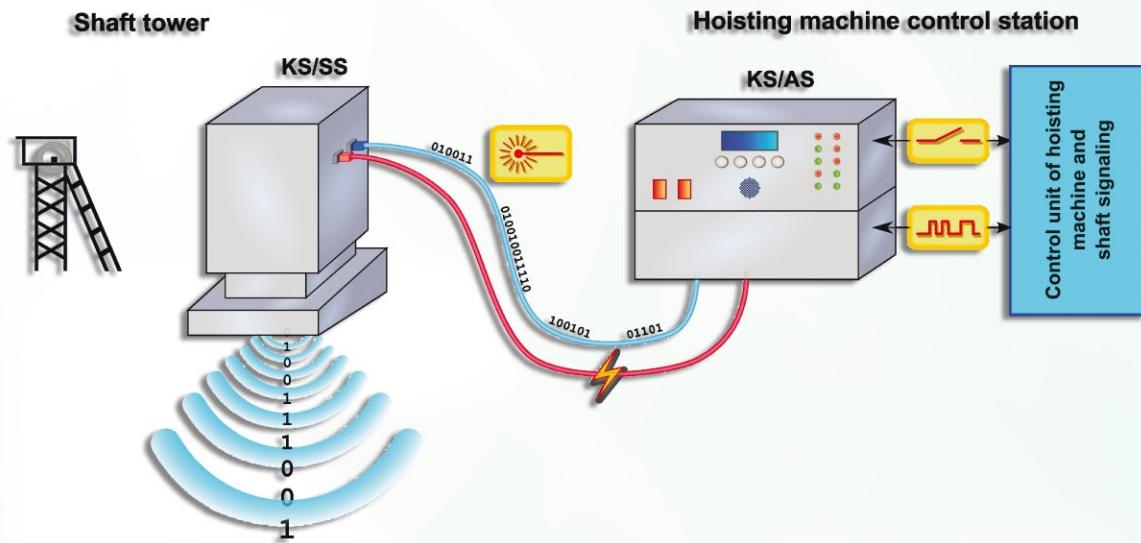


Visualization and recording system allows:

- periodically archiving of recorded files on the non-volatile memory media,
- graphical and sound presentation of recorded signals waveforms, events, and analog values,
- cooperation with overlaying control systems.

Mobile winder can be equipped with wireless signalling and communication device, named "Communicator", integrated with a winder steering systems.

One part of "Communicator" is located in cage and a second is located over the shaft. Both of them allows signalling, voice communication between winder operator and team in cage and wireless, remote control winder from the cage.

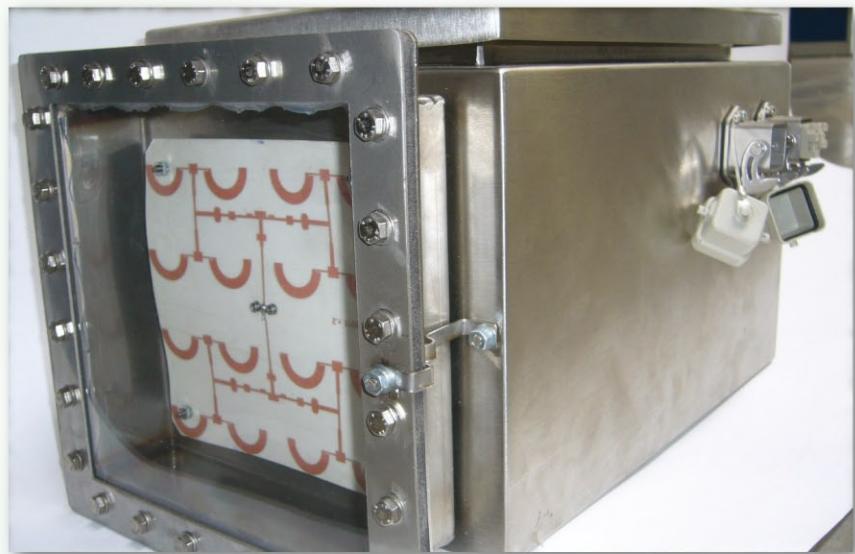


Shaft signalling system "Communicator" allows the connection of an array of signal from the position on the framework of the shaft to allow at least:

- blocking the machine from signaling station,
- giving an alarm signal,
- giving acoustic signals in any signal code,
- two-way voice communication between the operator in the shaft and the hoist driver.

"Communicator" system is intrinsically safe device according ATEX directive (I M1 Ex ia) and can be installed and used in explosive atmosphere of underground mines.

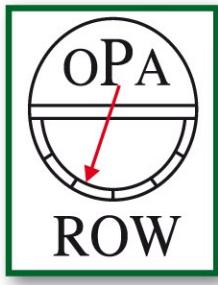
Mobile hoisting machine can also be combined with any other shaft communication system.
Signalling system "Communicator" accept network systems as:







YOU ARE INVITED TO COOPERATION!



Yours faithfully,

OPA-ROW sp. z o.o.
PREZES ZARZĄDU

Tadeusz Skrobol



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Na podstawie auditu jakościowego Euronis Certification udowodniono, że spełnione zostały wymagania w zakresie zarządzania jakością według normy

EN ISO 9001:2008 (PN-EN ISO 9001:2009)

(Protokół z auditu nr P019/2013)

Niniejszy certyfikat nr 016/P019/J
jest ważny do dnia 5 marca 2016 r.

Opole, dnia 6 marca 2013 r.



G

Georg Carstens
Kierownictwo Euronis Certific

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BS OHSAS 18001:2007

(Protokół z auditu nr P019/2013)

Niniejszy certyfikat nr 016/P019/O
jest ważny do dnia 05 marca 2016 r.

Opole, dnia 06 marca 2013 r.

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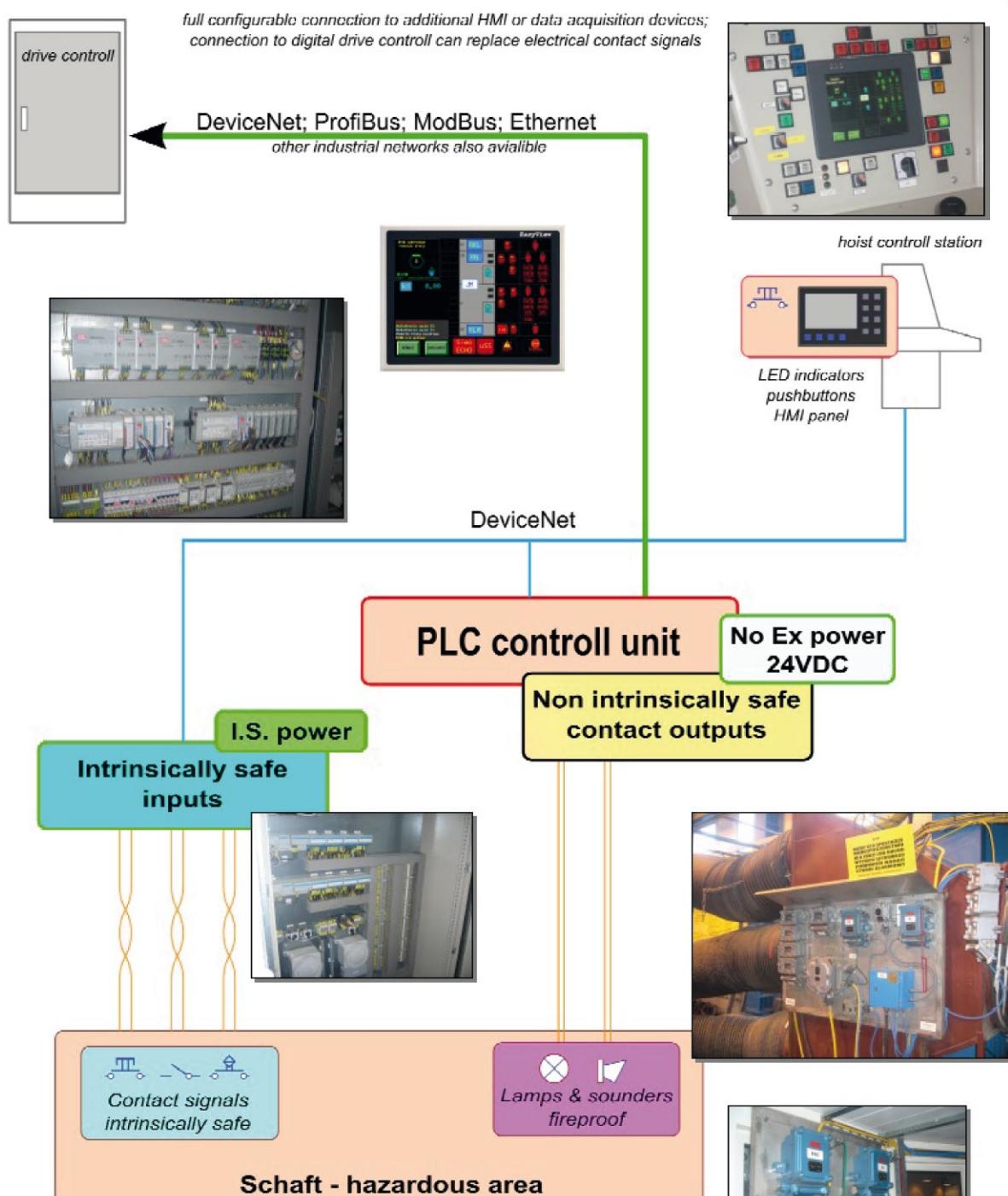
Georg Carstens
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Shaft Hoist Signalling System

Full ATEX shaft controll and diagnostic
with no any electronic devices installed in hazardous area



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