
KOPEX
GROUP

How we are organized

KOPEX GROUP

Innovative Mining Equipment
KOPEX Machinery

Electric Systems
KOPEX
Intelligent Power and Safety

KOPEX MINING

KOPEX INDUSTRY

Experiences from operating an automated longwall system PNIÓWEK coal mine

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TECHNICAL PARAMETER OF LONGWALL	
Lenght	240 [m]
Height	1,65 [m]
Thickness	1,4-2,0 [m]
Seam angle	do 12 [°] do 15 [°]
GEOMECHANICAL PARAMETERS	
Coal compression strength Rc roof	41,6 – 61,2 [MPa]
Coal compression strength Rc floor	23,6 – 77,2 [MPa]
HAZARDS	
Methane	IV
Dust	B
Water	I
Explosive category	C

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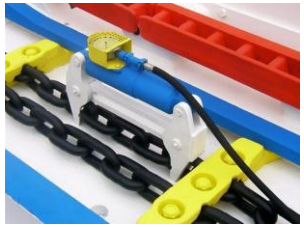
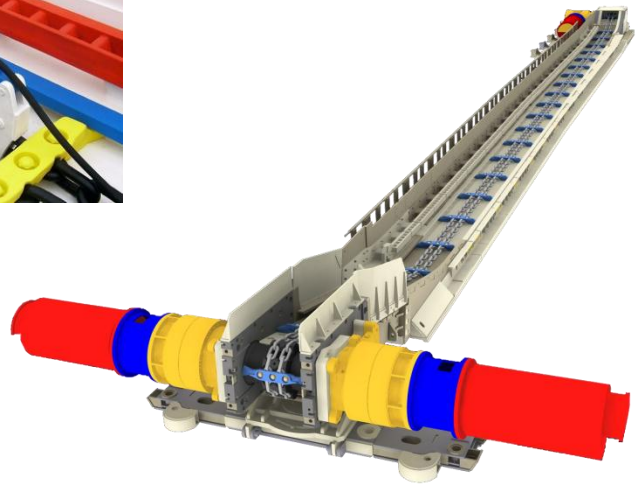
Animation of the Pniowek longwall

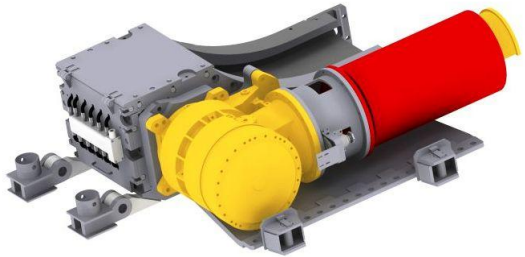
Type of shields	Shields TAGOR-11/26-POz	Face end shields TAGOR-11/26-POz/S
Parameter	**Value**	
Geometric height		
• maximum	2,6 m	
• minimum	1,1 m	
Range of operation height	1,3÷2,5 m	
Operation system	I.F.S.	Without I.F.S.
Type of Canopy	Rigid, with face sprag	Exendible, with face sprag
Suitable for seams inclined		
• along strike	up to 12º	
• along strike with special attachment	up to 35º	
• along dip	up to ±15º	
Support centre	1,5 m	
No. of Ø380 mm hydraulic legs	2 pcs.	
Leg support capacity		
• yield load (42 MPa)	2,968 MN	
• setting load (25-30 MPa)	1,767-2,121 MN	
Roof support capacity	0,78÷0,96MPa	0,73÷0,90 MPa
Roof support advance	0,8 m	
Advane force (25-30 MPa)		
• roof support	357-429kN	
• AFC	161-194 kN	
No. Of control functions	14	14+6
Weight	15033 kg	15690 kg

Parameter	Value
Cutting range	1,4÷2,0 m
Maximum power installed, - on cutting drums - on haulage drive - on hydraulic system	603 kW 2 x 250 kW 2 x 45 kW 13 kW
Supply voltage	1,0 kV
Diameter of cutting drums	1400 mm
Haulage speed	0 ÷ 20m/min
Height	1140 mm
Web	0,8m
Suitable for seams inclined along strike	up to $\pm 35^0$
Suitable for seams inclined along dip	up to $\pm 15^0$
Weight	ok. 30 t

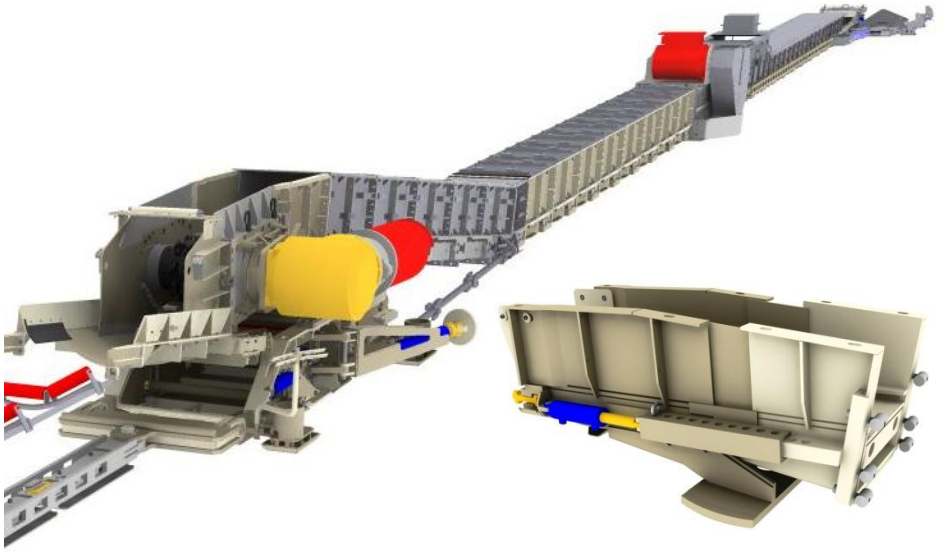
Parameters of AFC Rybnik- 850:	
Length	250 m
Line pan width	846 mm
Line pan length	1500 mm
Line pan profile	E260 rolled
Deck plate thickness	40 mm
AFC capacity	1100 Mg/h
Discharge drive:	
- Type	Straight
- Reductors	2 x rolled, size 25 as in RAGN 335000
- Installed power	2 x 105/315 kW
Return drive:	
- Type	Lowly profiled
- Reductor:	angular, size 25 as in RAGN 335000
- Installed power	1 x 105/315 kW
Motors:	Two-speed, water colled
- Power supply	1,0 kV
Chain:	2 x Ø34x126
- Speed on fast gear	1,3 m/s
Max angle of deflection between line pans - vertically - horizontally	 ±3,0º ±1,5º

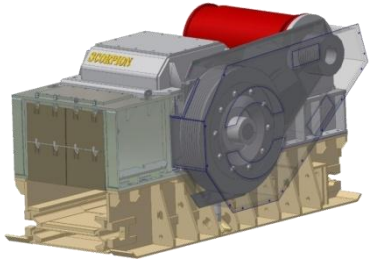






Parameters of beam stage loader Grot - 850:	
Length	61 m
Line pan width	846 mm
Line pan length	1500 mm
Line pan profile	260 mm
Deck plate thickness	gr. 40 mm
Capacity	1300 Mg/h
Drive:	
- Discharge type	front
- Reductors	2 x angular, RK 200
- Electric motor	2 x 160 kW, power supply 1,0 kV
Chain	2 x Ø30x108
- Speed on fast gear	1,5 m/s
Chain tensing	on boot end





Parameters of crusher Scorpion-1800P	
Capacity	1500 t/h
Scope of clearence under crushing drum	150÷300 mm
Hydraulic regulation of clearence	Hydraulic
Transmission type	Belt transmission
Power and powers upply of motor	132 kW, 1,0kV
Installation spot	Beam stage loader

Electrical equipment:

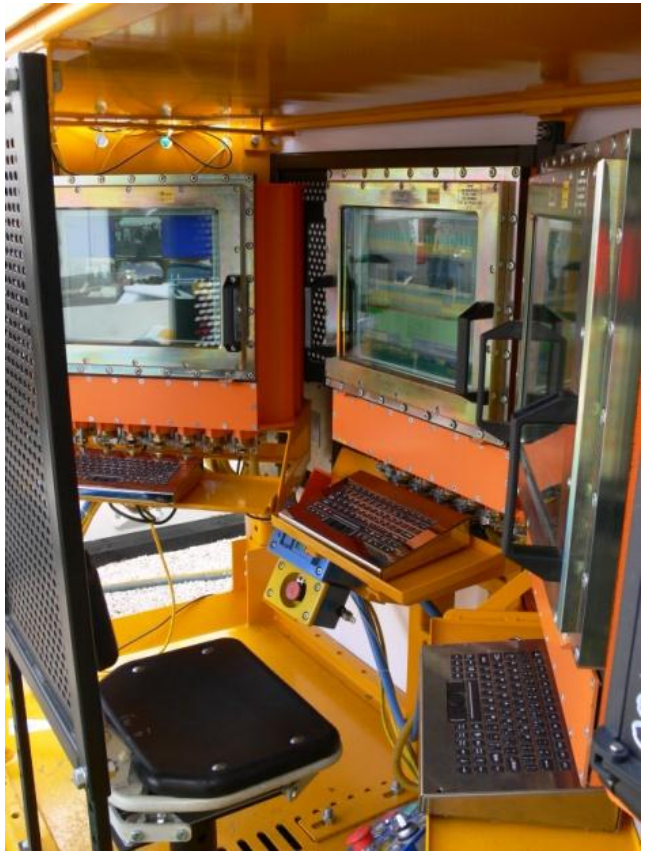
Transformers:

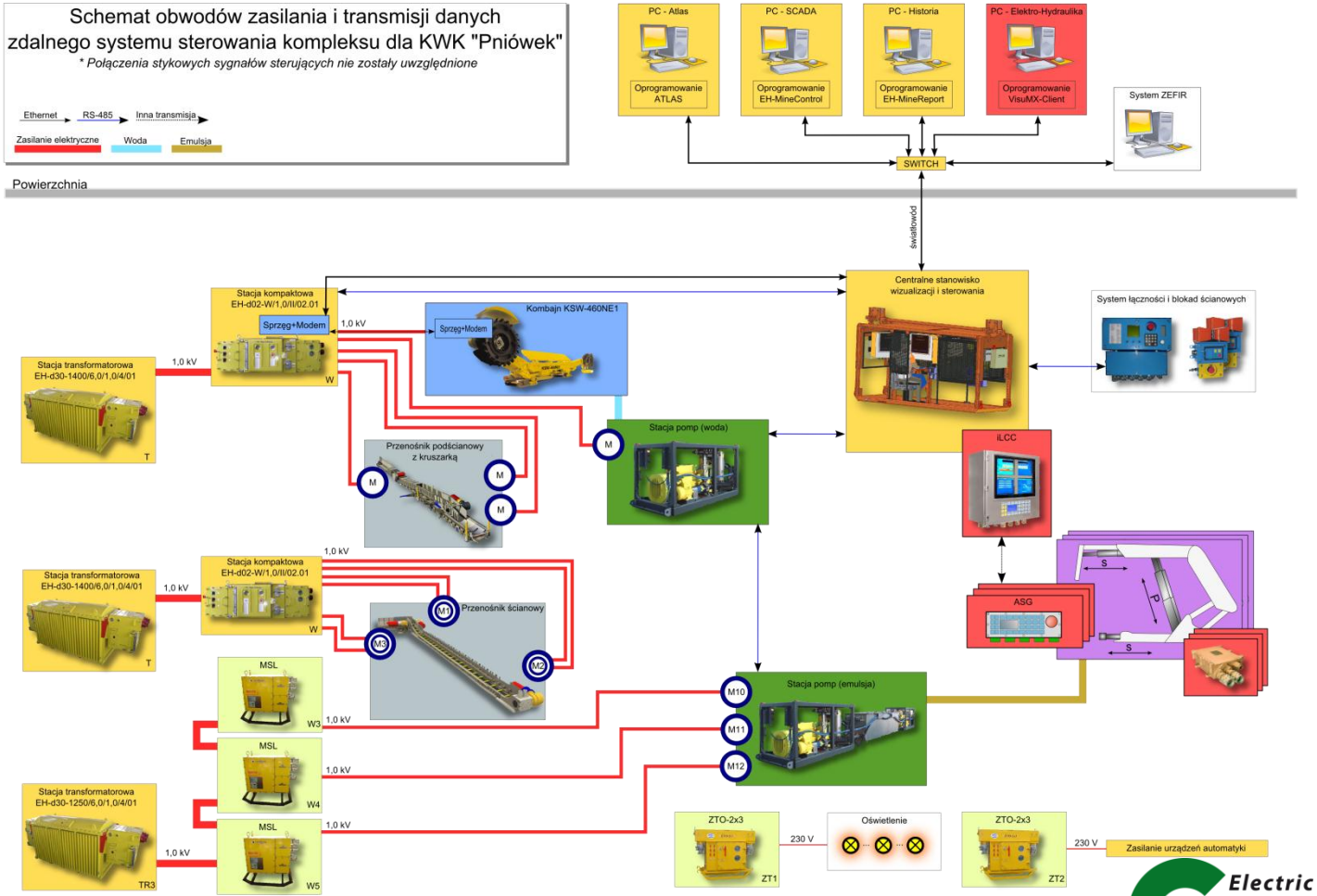
EH-d30-1400/6.0/1.0/4/01 - 1 pcs.

EH-d30-1250/6.0/1.0/4/01 - 1 pcs.

DCB: EH-d02-W/1,0/II/02.01 - 2 pcs.

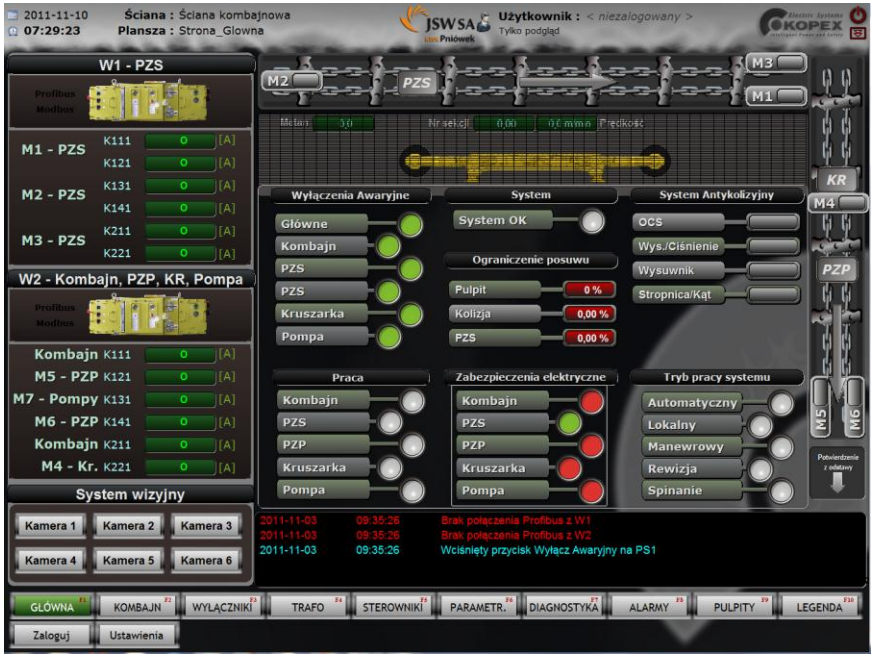
Control center




Schemat obwodów zasilania i transmisji danych
zdalnego systemu sterowania kompleksu dla KWK "Pniówek"
* Połączenia stykowych sygnałów sterujących nie zostały uwzględnione
Ethernet
RS-485
Inna transmisja
Zasilanie elektryczne
Woda
Emulsja
PC - Atlas
Oprogramowanie ATLAS
PC - SCADA
Oprogramowanie EH-MineControl
PC - Historia
Oprogramowanie EH-MineReport
PC - Elektro-Hydraulika
Oprogramowanie VisuMX-Client
System ZEFIR
SWITCH
Powierzchnia
światłowód
Centralne stanowisko wizualizacji i sterowania
System łączności i blokad ścianowych
Stacja kompaktowa EH-d02-W/1,0/II/02.01
Sprzęg+Modem
1,0 kV
W
Kombajn KSW-460NE1
Sprzęg+Modem
Stacja transformatorowa EH-d30-1400/6,0/1,0/4/01
T
Przenośnik podścianowy z kruszarką
M
Stacja pomp (woda)
iLCC
ASG
S
D
Przenośnik ścianowy
M1
M2
M3
MSL
W3
W4
W5
Stacja pomp (emulsja)
M10
M11
M12
Stacja transformatorowa EH-d30-1250/6,0/1,0/4/01
TR3
ZTO-2x3
ZT1
ZT2
230 V
Oświetlenie
Zasilanie urządzeń automatyki

Control system modes :

- Automatic
- Local
- Revision
- Service



Metan

CH_4

Conveyors

AFC

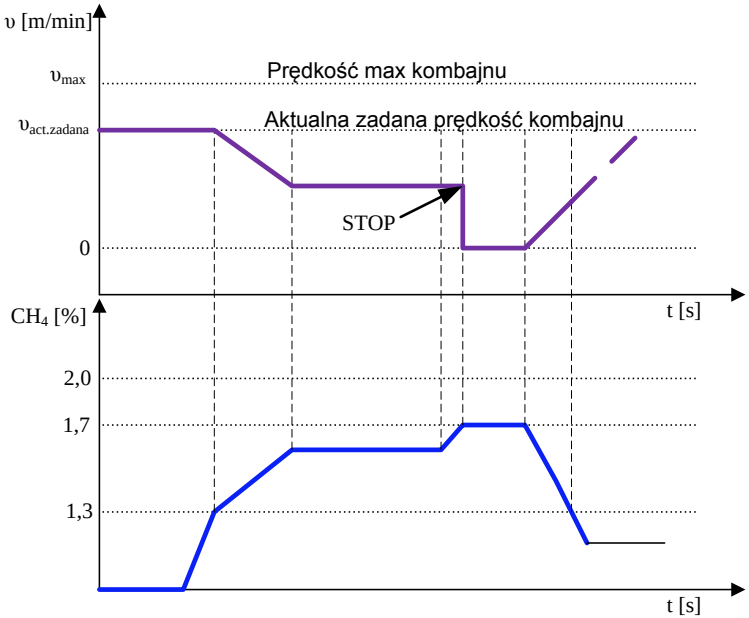
EH-SmartWall

IPC

EH-WallControl

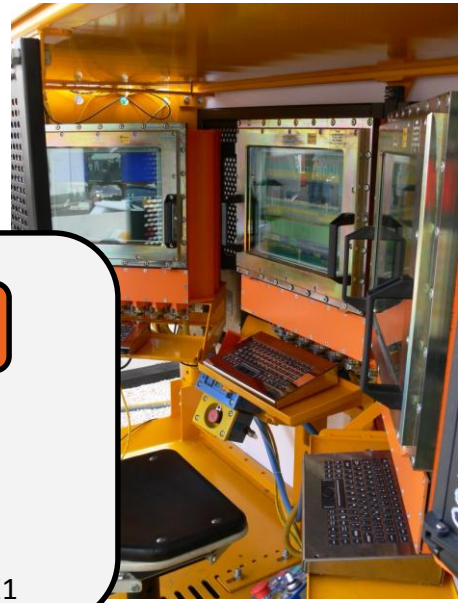
SCADA

EH-WallView



TCP/IP

$$\begin{bmatrix} CW_{IPC} \\ SW_{IPC} \\ DATA_{IPC} \\ PAR_{IPC} \end{bmatrix}$$



Eth

802.x

SCADA

PLC

x,y

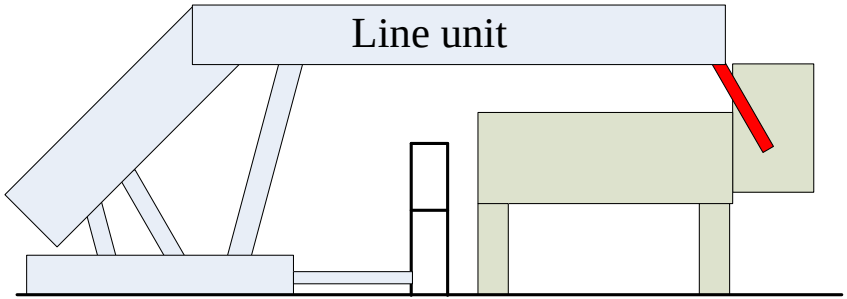
KSW-460NE1

Functionality – Coal Production speed optymalization

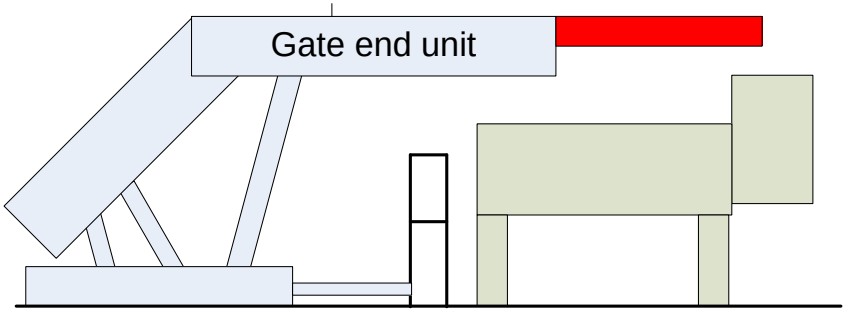
Electric Systems

Intelligent Power and Safety

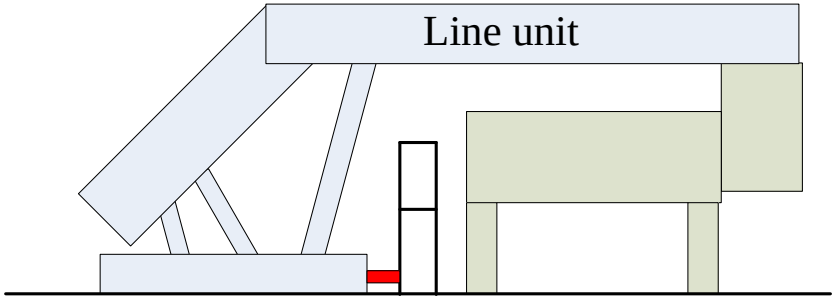
Flipper collision



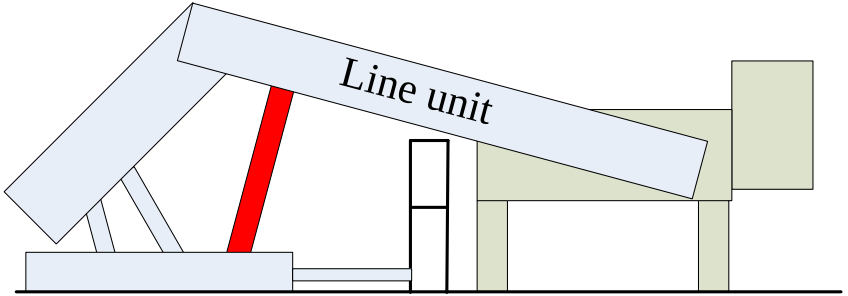
Deflect-extendable and flipper collision



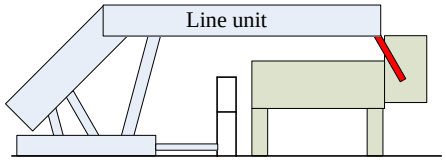
Canopy collision



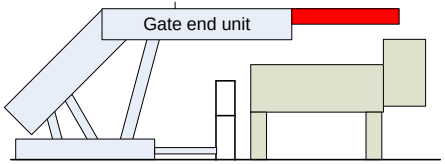
Canopy collision



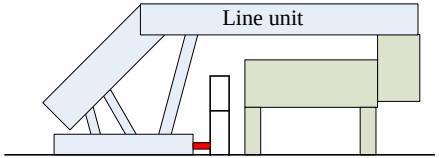
Flipper collision



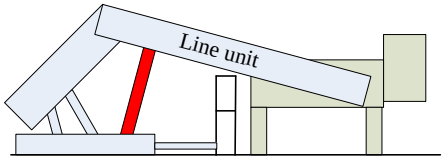
Deflect-extendable and flipper collision

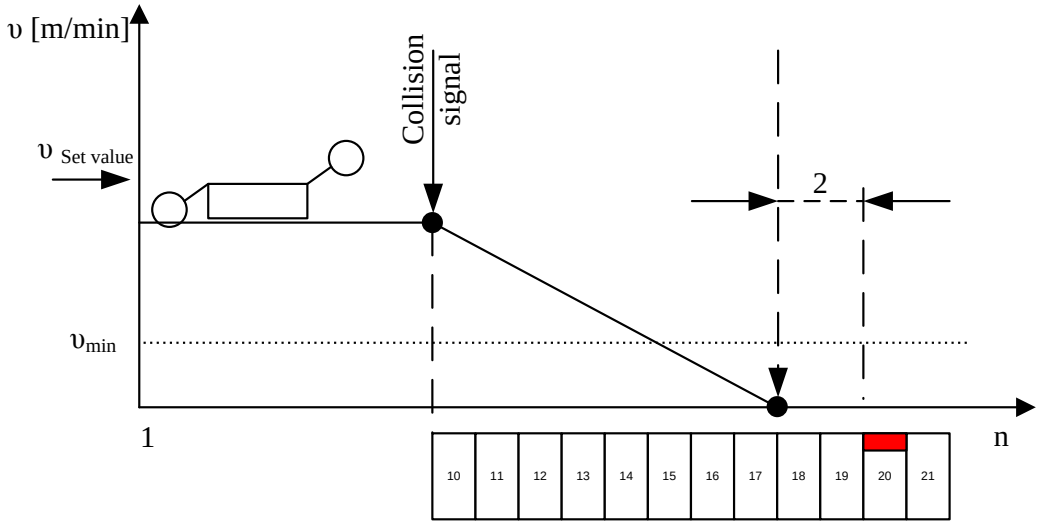


Canopy collision



Canopy collision





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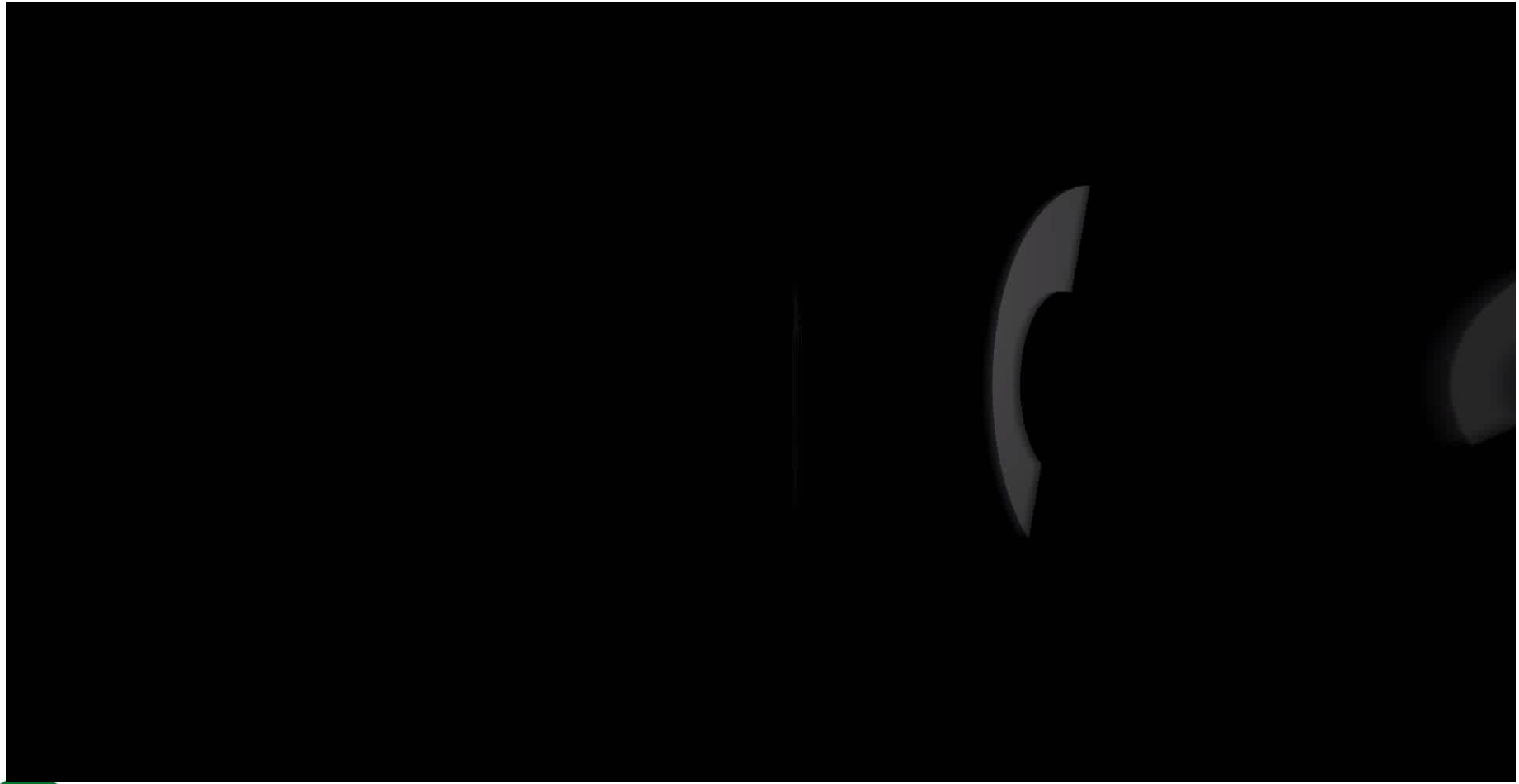
Detection of collision between powerd roof support and longwall shearer



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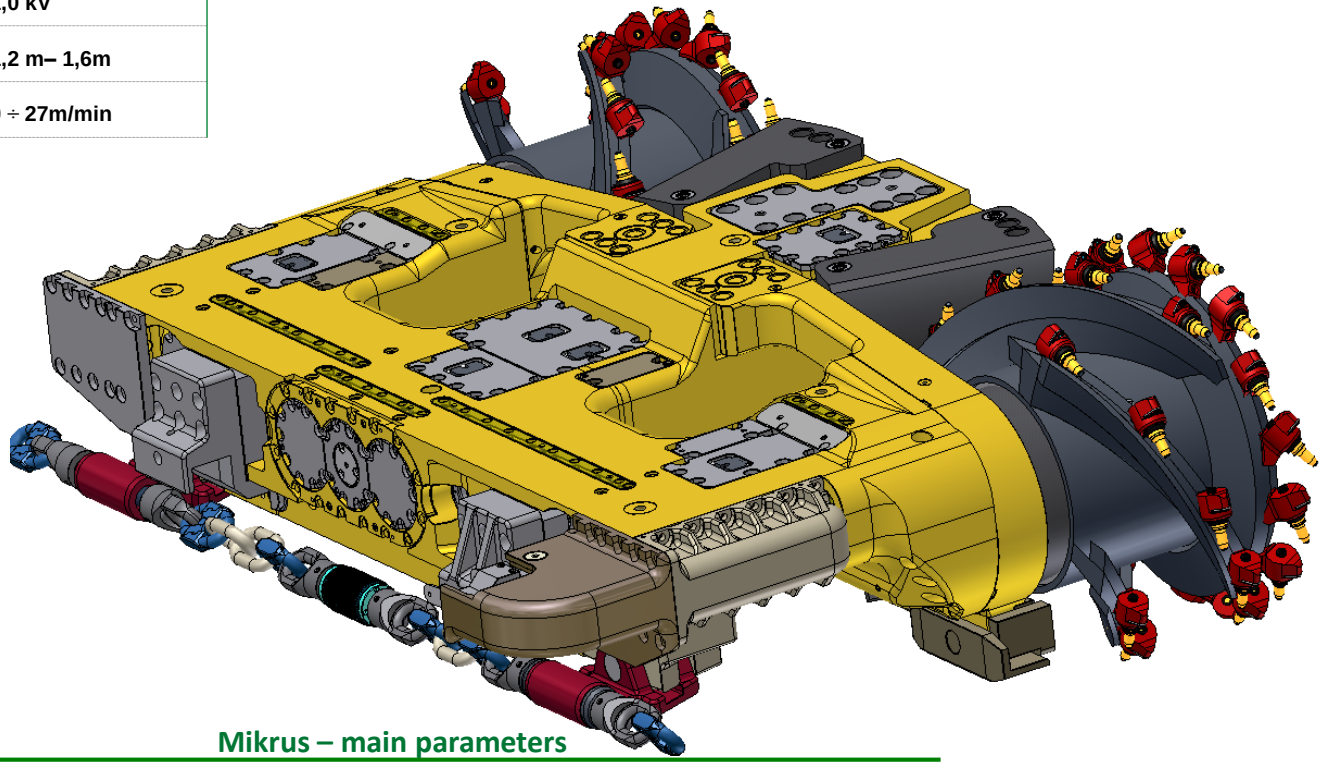
Feedback from Pniowek longwall CREW

SUMMARY

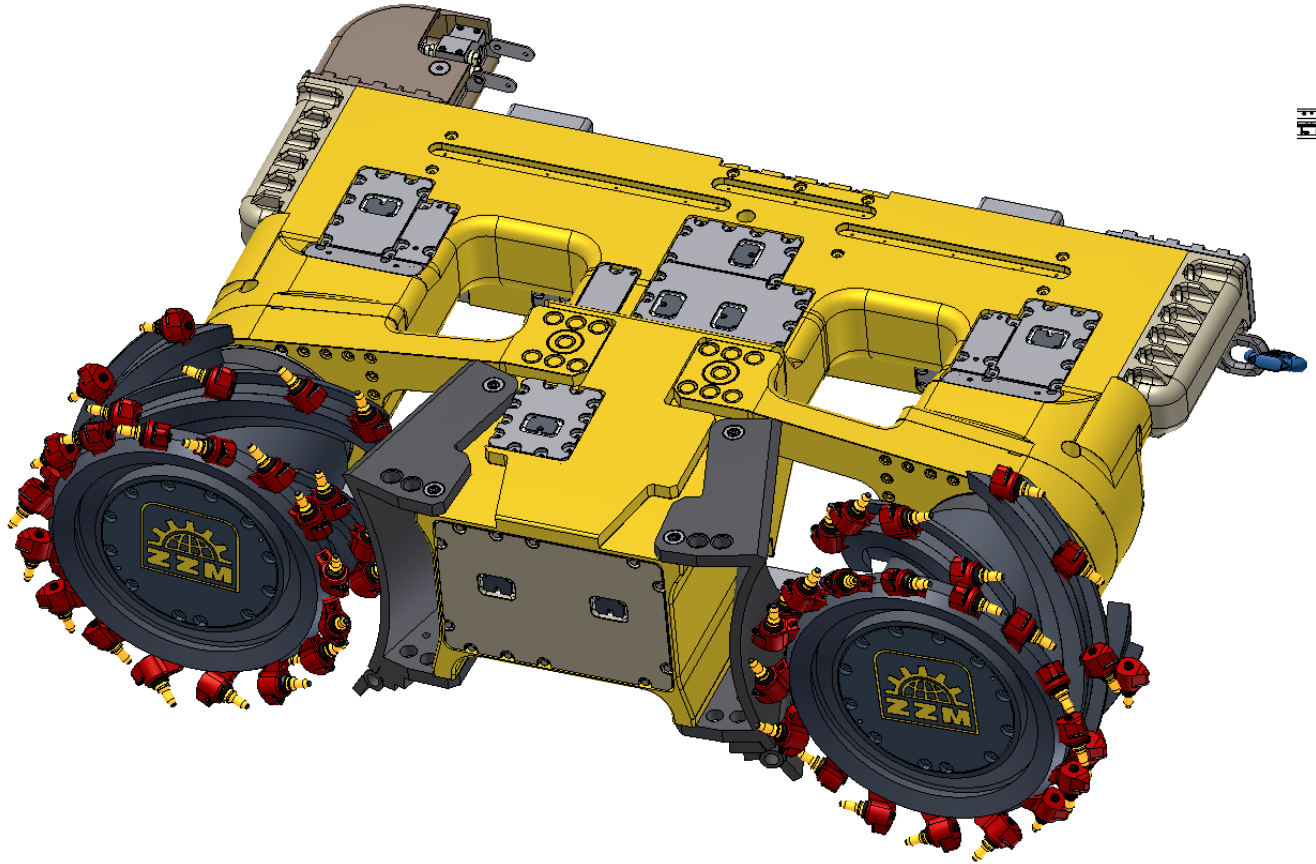
- Increased average productivity in comparison to another longwalls in Pniówek mine
- Limited numbers of miners in the Longwall
- Increased safety
- Reduce start up time
- Possibility of Remote Service and Help Desk

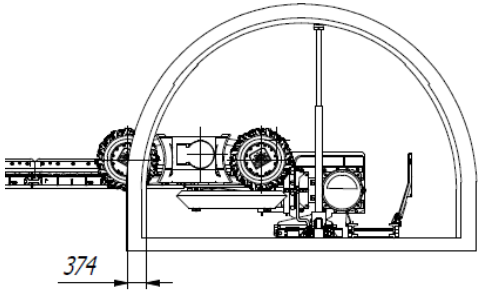
Mikrus – main parameters

Parameter	Value
Cutting range	1,1÷1,5 m
Maximum power installed	633 kW
Supply voltage	1,0 kV
Diameter of cutting drums	1,2 m– 1,6m
Speed	0 ÷ 27m/min



Mikrus





Thank You