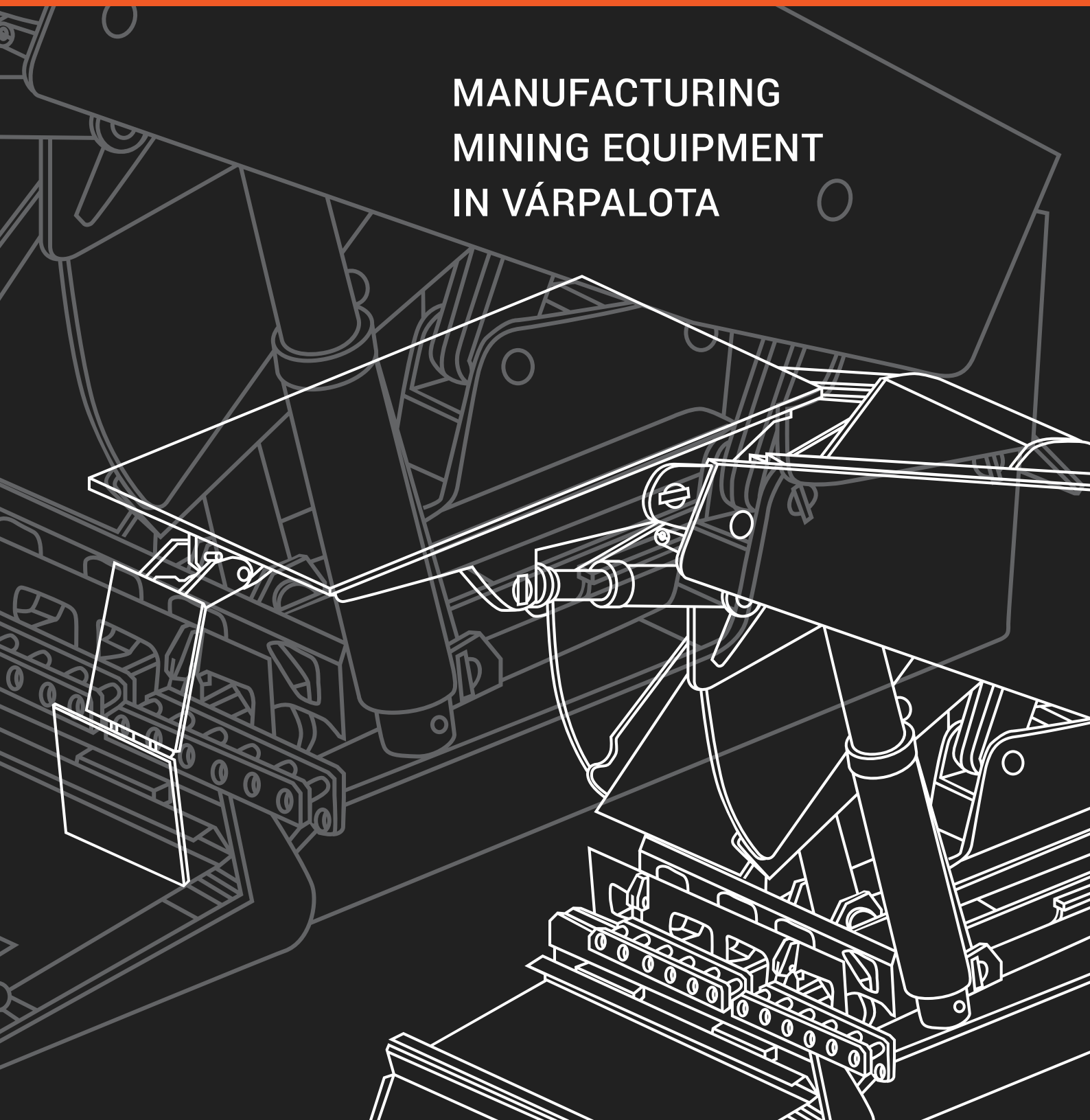
WELDMINKER

MANUFACTURING MINING EQUIPMENT IN VÁRPALOTA



DEVELOPMENT OF SHIELD PRODUCTION IN VÁRPALOTA

The first tests and development steps using operational hydraulic armoured shields in the Várpalota Basin began in 1960. Throughout the continuous development, after coming up with the Ursitz, Várpalota, BKI, OBV types, the so called "Hungarian type of shield" was developed with its cradle support system and circular support racks.

Based on operational experience, the shields were frequently modified. The newly developed parts were installed for testing, and if they worked fine and met the predefined needs, their inline production began.

Modifications were made such as: forcing the cradle, shoe extension, top modification, new face support, balljoint driving wedge installation, installation of complete hydraulic units (aggregates) and cylinders to each and every shield, shield back extension, fix point back prop modification, prop system replacement, central pump installation along with the appropriate cables and actuator valves and a proper cradle system.

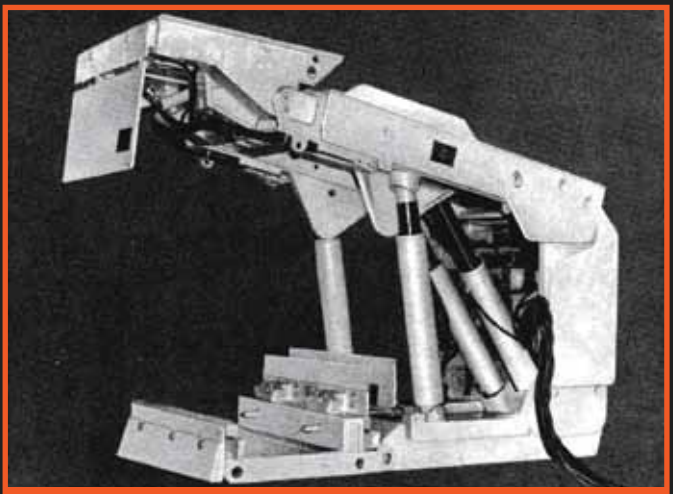
Based on tests, a suitable slit blocking system had to be developed in multiple versions. Many extensive tests were done to prevent coal face tilting outwards. The obtained support system was the one considered to be eligible for inline production. The couple of shields produced were applied successfully in the Hungarian mines of Várpalota, Borsod, Ózd and Oroszlány.

The demand for the products continuously increased, thus the financial and technical background for high number inline roduction had to be provided from own resources. As a result of the efforts put into Hungarian shield support engineering, more than 50 constructions came off the drawing board and were manufactured. Most of these were put into operation in Hungarian and foreign mining companies.

What more can prove the construction's capability for field application than the fact that within the frames of the collaboration with the German KlöcknerFerromatik mining machine manufacturing company, a shielded support system equipped with 2x600kN

VHP-512 pajzs

VHP-412 pajzs (Ajkai Bányaüzem)



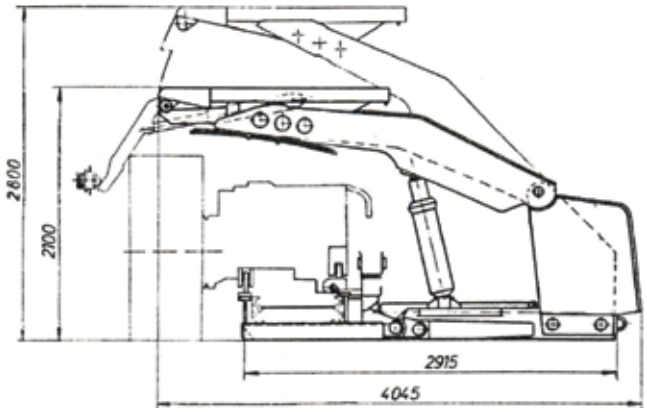
VHP-730 pajzs

circular support racks was shippedin 1970 for the German coal mining industry. Due to the good experiences with the support system, it became internationally known as the "Hungarian shield". Between 1970 and 1977 more than 3,100 shield units were exported from the Factory of the Várpalota Coal Mines. This amount was enough to provide about 4,000m of face support. The hydraulic units for the shields were manufactured and shipped by the Klöckner Ferromatik company.

The VHP730 type of top coal caving shield was designed based on the national and international experiences on top coal caving machinery, and the further development of the related technologies. The Várpalota Factory has signed an extensive collaboration in design, production and marketing with the German Klöckner Becorit and Thyssen Bergbautechnik, and the British Dowty Mining companies. As a result, the Várpalota Factory – together with Thyssen – has manufactured and shipped 27 shield units to Yugoslavia, to the Dobrnaja Lukovac Coal Mines in 1986. The unit was operating in Hungary (Dorog) from 1986, China (1987) and in South Korea as well. With the continuous increase in orders from abroad and the continuous development, the production of new type of shields began. As a direct consequence, the quality of the products increased and the shipping time was reduced. Furthermore, to ensure technological discipline, it necessary to introduce a quality control system which is independent from the production, where the foreign procurer's inspectors were present as well. Meeting the export demands was only possible by increasing the technical standards.

VHP-733, VHP-831, VHP-542, VHP-512

At this 50 year distance of time, in can be said that with the close cooperation of the experimental, production and design units, it became possible to create such a reliable automotive head support system in Hungary, which was able to provide the technical background for complexly mechanized mass producing active faces.



VOB-HP-102 shield

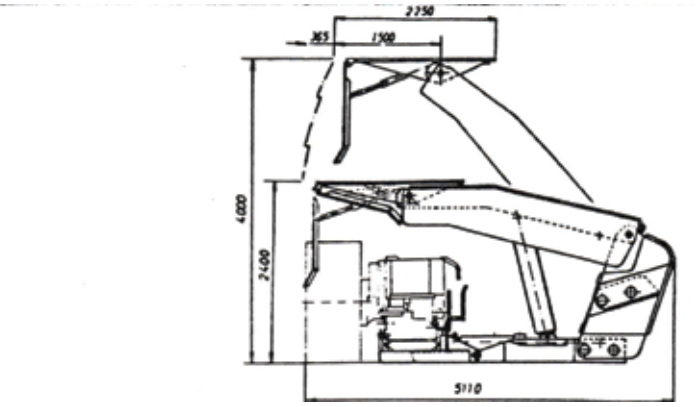
Adjustment range: 2,0 – 2,8 m

Rack capacity: 2x700 kN

Hitch load: 640 kN

Supporting force:
Before entry: 253 kN/m2
After entry: 324 kN/m2

Pitch: 1,2 m



VHP-114 shield

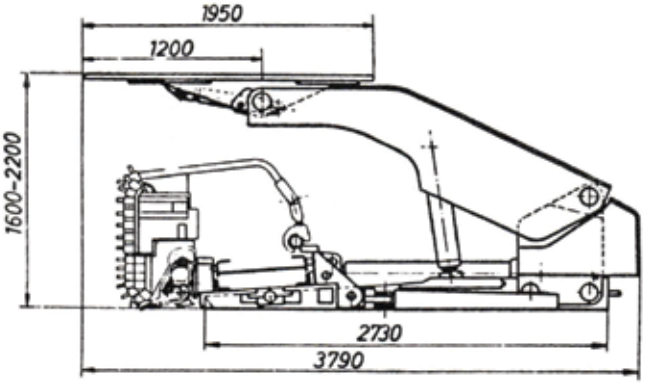
Adjustment range: 1,8 – 3,2 m

Rack capacity: 2x1600 kN

Hitch load: 1833–2120 kN

Supporting force:
Before entry: 371–511 kN/m2
After entry: 470–627 kN/m2

Pitch: 1,5 m



VHP-115 shield

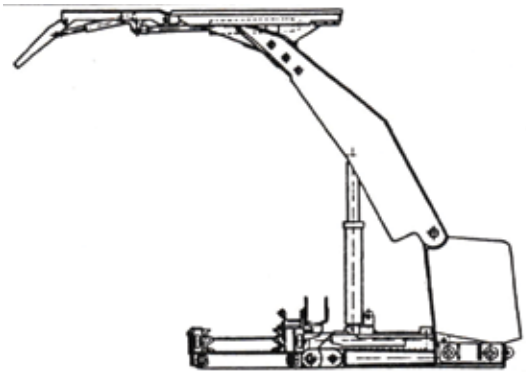
Adjustment range: 1,6–2,2 m

Rack capacity: 2x700 kN

Hitch load: 1016 kN

Supporting force:
Before entry: 211–232 kN/m2
After entry: 271–282 kN/m2

Pitch: 1,2 m



VHP-108 shield

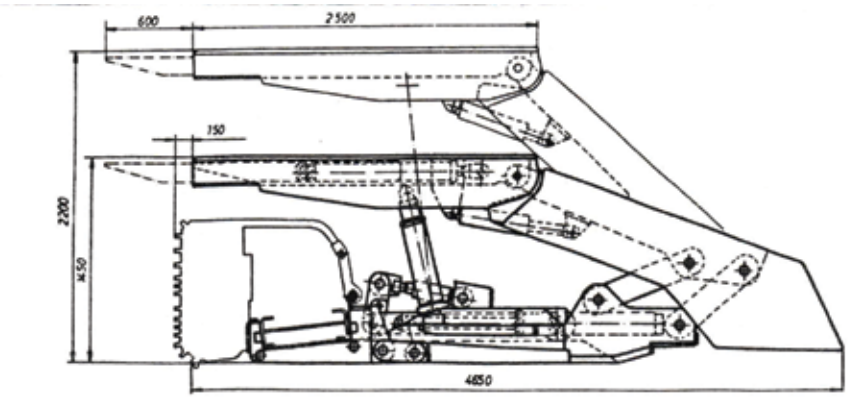
Adjustment range: 2,0 – 3,2 m

Rack capacity: 2x700 kN

Hitch load: 640 kN

Supporting force:
Before entry: 253 kN/m2
After entry: 324 kN/m2

Pitch: 1,2 m



VHP-211 shield

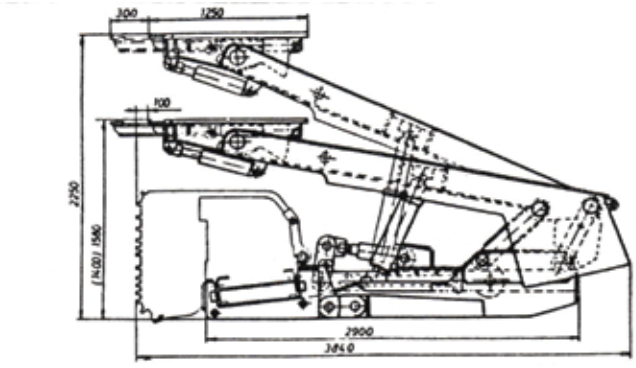
Adjustment range: 1,35–2,2 m

Rack capacity: 2x700 kN

Hitch load: 1270 kN

Supporting force:
Before entry: 325–337 kN/m2
After entry: 400–402 kN/m2

Pitch: 1,2 m



VHP-311 shield

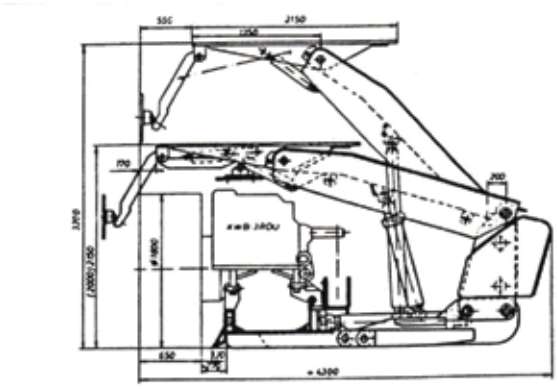
Adjustment range: 1,4–2,25 m

Rack capacity: 2x700 kN

Hitch load: 660 kN

Supporting force:
Before entry: 265–274 kN/m2
After entry: 384–395 kN/m2

Pitch: 1,2 m



VHP-117 shield

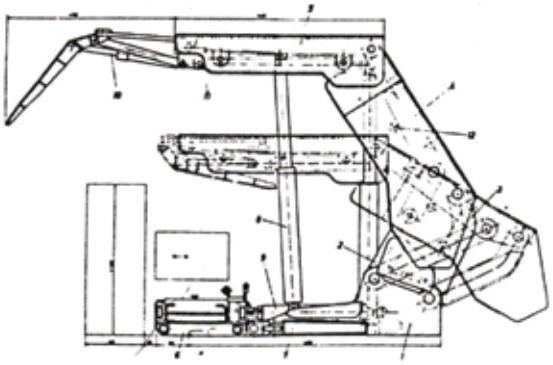
Adjustment range: 1,8 – 3,0 m

Rack capacity: 2x700 kN

Hitch load: 900 kN

Supporting force:
Before entry: 226–280 kN/m2
After entry: 289–350 kN/m2

Pitch: 1,2 m



VHP-931 shield

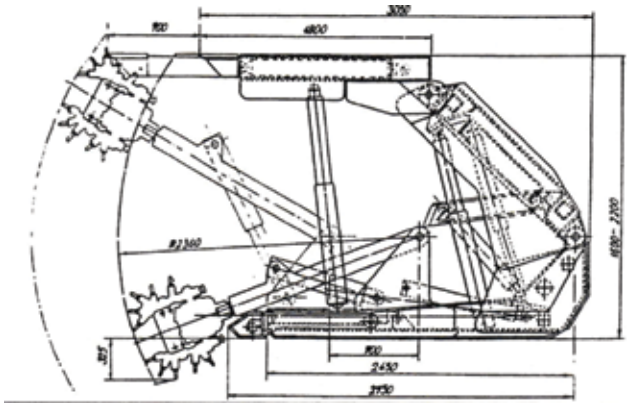
Adjustment range: 2,15–3,2 m

Rack capacity: 2x750 kN

Hitch load: 2909–2998 kN

Supporting force:
Before entry: 581–610 kN/m2
After entry: 724–746 kN/m2

Pitch: 1,5 m



MVDD-120 shield

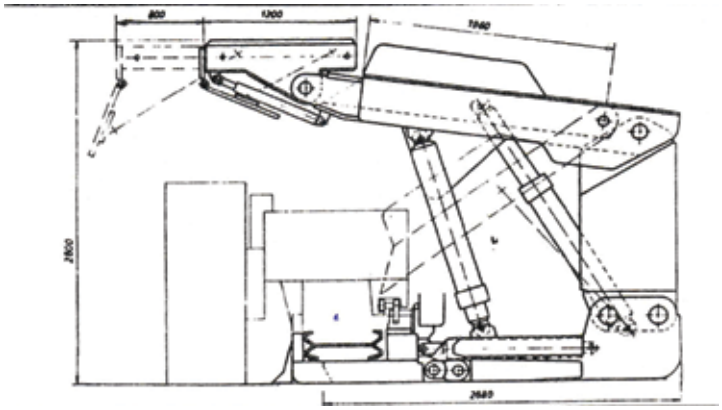
Adjustment range: 1,45–2,2 m

Rack capacity: 3x516 kN

Hitch load: 1400–1246 kN

Supporting force:
Before entry: 305–366 kN/m2
After entry: 417–497 kN/m2

Pitch: 1,31 m



VHP-732 shield

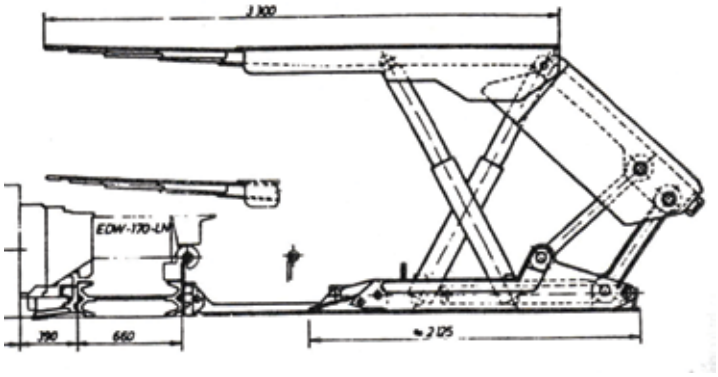
Adjustment range: 2,6 – 3,0 m

Rack capacity: 2x1000 kN

Hitch load: 3920 kN

Supporting force:
Before entry: 400/2 tám. kN/m2
After entry: 514/2 tám. kN/m2

Pitch: 1,5 m



VHP-801 shield

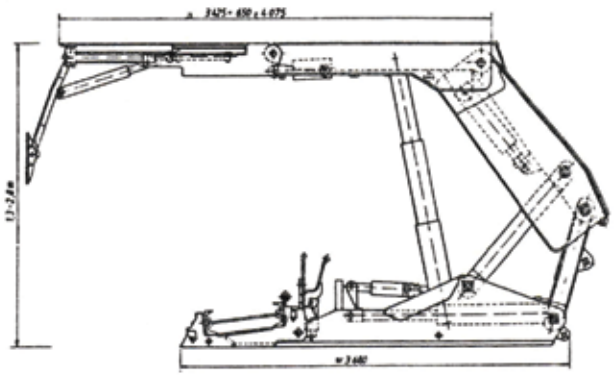
Adjustment range: 0,7 – 1,9 m

Rack capacity: 4x450 kN

Hitch load: 1800 kN

Supporting force:
Before entry: 346 kN/m2
After entry: 416 kN/m2

Pitch: 1,5 m



VHP-521 shield

Adjustment range: 1,3–2,8 m

Rack capacity: 2x1230 kN

Hitch load: 2218–2371 kN

Supporting force:
Before entry: 342–371 kN/m2
After entry: 402–437 kN/m2

Pitch: 1,5 m

REFERENCE LIST OF SHIELD TYPES

Type	Year of production	Installation location	Number sold
Series 100			
VOB-HP-102	1971–	*Hungary: Oroszlány*	594
		Komló, Borsod, Várpalota	
		Germany	206
VOB-HP-102/A	1972–	*Germany*	122
VOB-HP-102/B	1972	*Germany*	34
VOB-HP-103	1972–	*Germany*	72
VOB-HP-104	1972–	*Germany*	125
VOB-HP-104/B	1974–	*Germany*	127
VOB-HP-105	1972–	*Germany*	125
VOB-HP-106	1972–	*Germany*	148
VOB-HP-107	1972–	*Germany*	193
VHP-108	1976–	*Hungary: Várpalota*	537
		Tatabánya, Oroszlány	
VHP-109	1973–	*Germany*	138
VHP-110	1973–	*Germany*	115
VOB-HP-113	1973–	*Germany*	120
		Hungary: Várpalota	47
VHP-114	1976–	*Prototype*	2
VHP-115	1976–	*Hungary: Balinka,Várpalota*	153

VHP-115/A	1976	*Hungary: Balinka, Várpalota*	38
VHP-115/A *planer*	1976	*Hungary: Balinka, Várpalota*	11
VHP-116	1977–	*Hungary: Ajka, Várpalota*	75
VHP-117	1979–	*Hungary: Tatabánya*	85
VHP-118	1980–	*Hungary: Tatabánya* Germany	293
VHP-131	1987–	*Hungary: Várpalota*	50
VHP-160	1971–	*Hungary: Veszprém Coal Mines*	78

Series 200

VHP-211	1978–	*Prototype*	
VOB-HP-220	1968–	*Hungary: Várpalota, Putnok, Oroszlány, Lyukóbánya, Borsod, Ózd Coal Mines*	643

Series 300

VHP-311	1978–	*Hungary: Várpalota* *Germany*	50
VHP-331	1985–	*Hungary: Várpalota*	45

Series 400

VHP-412	1985–	*Hungary: Balinka, Ajka, Veszprém Coal Mines, Borsod*	431
VHP-412/A	1985–	*Hungary: Balinka, Ajka, Veszprém Coal Mines, Borsod*	52
VHP-412 M	1986–	*Hungary: Ajka, Balinka*	48

Series 500

Series 600

Series 700

Series 800

Series 900

VHP-931	1982–	*Hungary: Dudar*	60

Other

MVD-160	1983	*Hungary: Pécs-Mecsek*	90
MDMO-320	1984–	*Hungary: Pécs-Mecsek*	20
DMO-320	1985	*Hungary: Pécs-Mecsek*	73
MVD-120	1986–	*Hungary: Pécs-Mecsek*	3
S-88	1989–	*Prototype*	

COMMENT

Besides the different type of safety systems, numerous shield accessories were shipped to national and foreign mines: small and large roof + slit block, shoe, back, cradle, moreover custom pieces and accessories.

SERIES 100

Cradle supported shield with limiting circular support racks. Shield type with a general design to cave thicker units.

SERIES 200

Cradle supported shield with a limiting and lemniscate system.

SERIES 300

Cradle supported shield with a limiting and lemniscate system.
Shield type designed for supporting weaker seams with an easily fracturing top.

SERIES 400

Cradle supported shield without limiting circular support racks. Can be quickly assembled due to its small size, and easily transportable even when assembled, designed for medium thick seams.

SERIES 500

Supported shield with a limiting and lemniscate system without cradle support. Shield type designed to stand extremely stress when caving thin and thick seams.

SERIES 600

Supported shield with a limiting and lemniscate system, with four racks and without cradle support.
Heavy-duty shield designed to stand extremely stress when caving thick seams with rigid limestone or sandstone tops.

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