

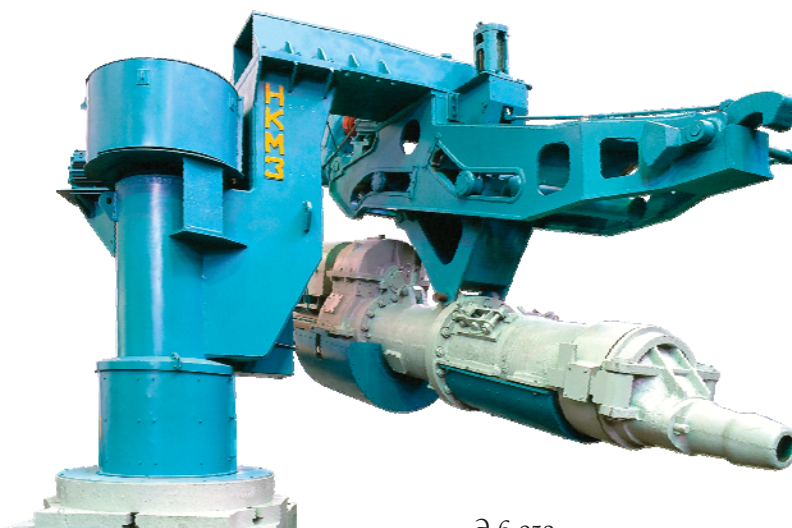
## Metallurgical equipment.

### Equipment for blast-furnace melting operation stage

### Equipment of electromechanical complex for the taphole servicing

#### TAPHOLE PLUGGING MACHINES

Taphole plugging machine is designed to plug iron taphole of blast furnace after heat tapping. It is installed in the blast furnace cast house.



Э-6-050

#### Technical characteristics

Parameter	Value			
Model	Э-6-050, Э-7-050	Э-6-035, Э-7-035	Э-19-050	Э-19-035
Clay gun:				
- inner diameter of working cylinder, mm	650	500	650	600
- full piston stroke, mm	1505	1505	1415	1415
- volume of stroke, m <sup>3</sup>	0,5	0,35	0,5	0,35
- piston force, kN (tf)	2354,4 (240)	2354,4 (240)	3520 (350)	3000 (300)
- refractory mixture pressure under piston, MPa (kgf/cm <sup>2</sup> )	7 (72)	11,97 (122)	10,6 (106)	10,6 (106)
- time of piston forward stroke, s	155	155	129	108
- taphole clay exit speed from gun spout, m/s	0,182	0,108	0,22	0,188
Pressing device:				
- spout pressing force, MN	0,117	0,117	0,12	0,12
- carriage travel time, s	7	7	8	8
- max. travel length of the carriage, mm	855	855	950	950
Rotary device:				
- max. arm rotation angle, degree	180	180	180	180
- rotation time, s	15	15	15	15
Lubrication	Centralized, grease lubrication, manual			
Pressing gearbox	Oil bath lubrication			

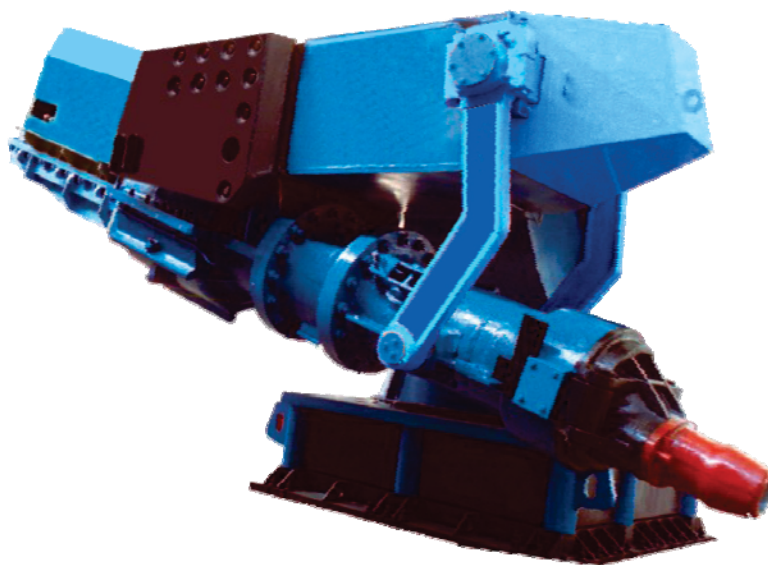
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#### TAPHOLE PLUGGING MACHINES

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M3ЧЛ-2-025

#### Technical characteristics

Parameter	Value	
	M3ЧЛ-2-025/170	M3ЧЛ-2-025/150
<b>Model</b>	M3ЧЛ-2-025/170	M3ЧЛ-2-025/150
<b>Clay gun:</b>		
- inner diameter of working cylinder, mm	500	500
- full piston stroke, mm	1275	1280
- volume of stroke, m <sup>3</sup>	0,25	0,25
- piston force, kN (tf)	3286,4 (335)	2394 (295)
- refractory mixture pressure under piston, МPa (kgf/cm <sup>2</sup> )	17 (170)	15 (150)
- time of piston forward stroke, s	77	93
- taphole clay exit speed from gun spout, m/s	0,18	0,176
<b>Pressing device:</b>		
- spout pressing force, MN	0,129	0,14
- carriage travel time, s	-	-
- max. travel length of the carriage, mm	-	-
<b>Rotary device:</b>		
- max. arm rotation angle, degree	155	180
- rotation time, s	12	13
<b>Lubrication</b>	Centralized, grease lubrication, manual	
Pressing gearbox	Oil bath lubrication	

**Metallurgical equipment.**

**Equipment for blast-furnace melting operation stage**

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 taphole servicing**

TAPHOLE OPENING MACHINE

Taphole opening machine is designed to open iron taphole of blast furnace during heat tapping. It is installed in the blast furnace cast house.

Technical characteristics

Parameter	Value
Feed travel, mm	3800
Penetration speed , m/min	1,2
Delivery speed, m/sec	1
Rotation angle, degree	+145° - 145°
Rotation radius, mm	4100

LAUNDER COVER LIFTING MANIPULATORS

Manipulator is designed to lift launder covers to make an access to iron tapholes and to taphole plugging/opening machines. It is installed in the blast furnace casthouse.

Technical characteristics

Parameter	Value
Load carrying capacity, t	20
Rotation angle, degree	130
Lifting speed, m/min	10
Clamping length min, m	2,5
Clamping length max, m	9,15

CENTRAL HYDRAULIC-AND-PNEUMATIC PLANT

Central hydraulic-and-pneumatic plant of the machines is designed to service taphole opening and plugging machines, launder cover lifting manipulator and consists of hydraulic tanks, pumps unit, hydro equipment supporting poles, hydraulic cylinders, pneumatic motors, pneumatic equipment, air (nitrogen) preparation unit, compressor.

CONTROL SYSTEM

Control system is designed for step-by-step control of taphole opening and plugging machines and manipulator.