

P&H

KOBELCO



320H

Crane, Clamshell, Dragline

 **KOBE STEEL, LTD.**

Courtesy of Crane Market

AVL 1011 No. 320H-105

Specifications

P&H **KOBELCO**

320H

Basic Machine

● UPPER MACHINERY



POWER PLANT:

Diesel: Mitsubishi 6DB10CK (standard).....
6 cyl., 110 mm (4.33") bore x 150 mm (5.91")
stroke, 8,553 cc (522 cubic inch) displace-
ment, 4 cycle, water cooled, 96 PS @ 1,400
rpm full load engine output.
G.M. 4-53N (optional) 4 cyl., 94 PS @ 2,000 rpm

FUEL TANK: Capacity 220 liters (58.1 US gal.)

THROTTLE: Hand grip control for all operations, standard.

TRANSMISSION: 2 speed transmission, high gear is normal operating speed.



BOOM HOIST ASSEMBLY: Independent planetary gear type with external ratchet and automatic brake provides for raising or lowering boom under power and locking boom. Drum mounted on anti-friction bearings.

Clutch—Band type internal expanding, 406.4 mm (16") dia. x 63.5 mm (2.5") wide.

Brake —Band type external contracting, 457 mm (18") dia. x 63.5 mm (2.5") wide.

Drum Pitch Dia. 230 mm (9.06")

Drum Length 145 mm (5.71")

Cable Dia. 14 mm (0.55")

Line Speed (1st layer):

Raising 48 m/min (157 fpm)

Lowering 28 m/min (92 fpm)



MAIN DRUM ASSEMBLY: Drums opposite each other mounted on anti-friction bearings on single drum shaft.

Clutches—Band type internal expanding, 584 mm (23") dia. x 76 mm (3") wide.

Brakes—Band type external contracting, 711 mm (28") dia. x 89 mm (3.5") wide.

Drum Pitch Dia. 440 mm (17.32")

Drum Length..... L.H.: 266 mm (10.47")

R.H.: 266 mm (10.47")

Drum Total Capacity 90 m (295')

Cable Dia. 20 mm (0.79")

Line Pulls 7,450 kg (16,400 lbs.)

Line Speed (1st layer):

Raising 54 m/min (177 fpm)

Lowering 24 m/min (79 fpm)



TYPE OF FASTENING TO LOWER: 5 adjustable hook rollers—two double hook rollers rear, one single hook roller front.

SWING ROLLERS: 26 rollers live roller circle.

SWING GEAR: Internal cut teeth.

ROTATING SPEED: 4.7 rpm

SWING CLUTCHES: Double shoes type internal expanding—533.4 mm (21") dia. x 114.4 mm (4.5") wide.

SWING BRAKE: Spring set—hydraulic release, V-type.



CONTROLS: Direct acting hydraulic.

POWER BOX: All gear run in oil bath. All shafts are involute splined.

GANTRY: High gantry folding type.

COUNTERWEIGHT: Internal non-removable punchings in counterweight box at rear of machine 2,700 kg (5,940 lbs). Removable casting counterweight,

4,200 kg (9,260 lbs)for crane use
2,000 kg (4,410 lbs)for clamshell and dragline use

SAFETY DEVICES: Boom over hoist alarm bell, Crane over hoist alarm bell, Boom angle indicator, Boom backstop, Signal horn, Boom hoist drum lock, Main hoist drum lock, Boom over hoist kickout (Automatic boom hoist limiting device). Over load warning device (Optional for Crane use).

TOOLS, LUB KIT AND ACCESSORIES: A set of tools, lubrication kit and accessories are furnished as standard. Electrical installations such as Inside cab light, Two flood lights (2 x 60 W), Inspection lamp, ammeter, Water temperature gauge, Fuel gauge, Oil pressure gauge, and Window shield wiper are furnished as standard.

● LOWER MACHINERY

CARBODY AND AXLES: All-welded unitized construction.



TRACTOR TYPE CRAWLERS: Automatic spring-loaded track tension. 9 lower rollers in each frame, with double rolling surfaces, 178 mm (7") dia.

CRAWLER DRIVE: Spring loaded double acting propel and steering brakes release automatically under engine power when traveling, set automatically when propelling power not applied. Independent travel.

STEERING MECHANISM: Sliding jaw clutches, one on each side control application of propelling power to each crawler. When either side is disengaged, propel brake on that side remains set, thus locking that crawler.

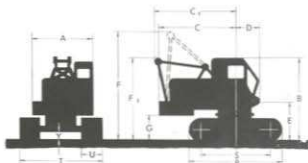
CRAWLER SHOES: Total number—both sides 98
Forged flat shoes—standard width 760 mm (30")
Forged flat shoes—optional width 590 mm (24")

TRAVEL SPEED: Normal 1.7 km/h (1.06 mph)
In low range 1.0 km/h (0.62 mph)

GRADE ABILITY 30%

● GENERAL DIMENSIONS

	Meters	Inches
A—Width of cab	2.69	(105.9)
B—Height to top of cab	3.16	(124.4)
C—Radius of rear end		
with 4,200 kg (9,260 lbs.) counterweights	3.41	(134.3)
with 2,000 kg (4,410 lbs.) counterweights	3.35	(131.9)
C ₁ —Radius of rear end (gantry lowered)	3.41	(134.3)
D—Center of rotation to boom foot pin	1.00	(39.4)
E—Height from ground to boom foot pin	1.45	(57.1)
F—Clearance height over gantry (raised)	4.19	(165.0)
F ₁ —Clearance height over gantry (lowered)	3.20	(126.0)
G—Counterweight ground clearance	0.92	(36.2)
R—Overall length of crawlers	4.15	(163.4)
S—Center to center of sprockets	3.34	(131.5)
T—Overall width of crawlers	3.03	(119.3)
U—Width of shoes		
standard	0.59	(24.0)
optional extra	0.76	(30.0)
Y—Ground clearance of carbody (lowest point)	0.37	(14.6)



● GENERAL DATA

BOOM: Angle lattice alloy steel construction.

Basic length, open throat and bolt connected in two equal sections 9.14 m (30')

With three offset boom point sheaves on anti-friction bearings, bottom dia. 451 mm (17.76")
12 part boom hoist reeving standard.

BOOM INSERT (Optional): Insert length 3.05 m (10'),

6.10 m (20'),

Maximum boom length 30.48 m (100')

Single sheave hook block for 1-3 part hoist line, 3 part hoist line, optional 13 metric ton

JIB (Optional): Tubular lattice carbon steel construction.

Basic length, bolt connected in two sections 6.10 m (20')

Open throat with one boom point sheave.

JIB INSERT (Optional): Insert length 3.05 m (10')

Maximum jib length 9.14 m (30')

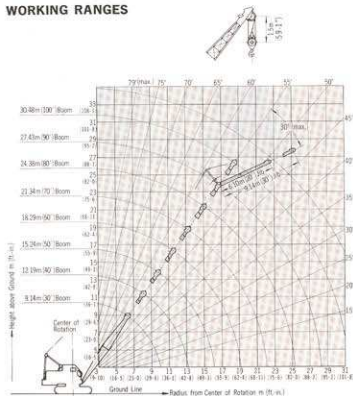
POWER CONTROLLED LOAD LOWERING: Planetary device for lowering load under power (left hand grooved drum), standard for Crane use (Main hoist only).

GANTRY: High gantry folding type.

WORKING WEIGHT: (Including block) 26,600 kg (58,600 lbs.)

(2,700 kg (5,940 lbs.) non-removable punchings and 4,200 kg (9,250 lbs.) cast removable counterweight included in weight, furnished as standard.]

WORKING RANGES



DRUM SHAFT ASSEMBLY

Lifting Crane Drums (P.D.)	Cable Dia.	Max. Cable Capacity	Line Pulls	Line Speeds
L.H. 440 mm (17.32")	20 mm (0.79")	90 m (295')	7,450 kg (16,400 lbs.)	54 m/min. (177 fpm)
R.H. 440 mm (17.32")	20 mm (0.79")	90 m (295')	7,450 kg (16,400 lbs.)	54 m/min. (177 fpm)

* Line Pulls and Line Speeds based on single part line in normal operating (2nd) gear.

** L.H. grooved drum (crane with power lowering); R.H. grooved drum.

GROUND PRESSURES

Shoe Width	590 mm (24")	760 mm (30")
kg/cm ² (lbs. per sq. in.)	0.62 (8.82)	0.50 (7.11)

● LIFTING CAPACITIES

RATED CRANE LOADS IN KG (LBS.)—MAIN BOOM IN 360° WORK AREA

Operating Radius in Meters (Ft.-in.)	9.14 m (30') Boom			12.19 m (40') Boom			15.24 m (50') Boom			18.29 m (60') Boom		
	Angle (°)	Boom Pt. El.	Rating	Angle (°)	Boom Pt. El.	Rating	Angle (°)	Boom Pt. El.	Rating	Angle (°)	Boom Pt. El.	Rating
3.0 (9-10)	78	10.4 (34-0)	22,500 (49,600)									
3.5 (11-6)	74	10.2 (33-7)	18,130 (39,970)	78	13.4 (43-11)	18,050 (39,790)						
4.0 (13-1)	71	10.1 (33-1)	14,750 (32,520)	76	13.3 (43-6)	14,670 (32,340)	79	16.4 (53-9)	14,590 (32,170)			
4.5 (14-9)	68	9.9 (32-6)	12,400 (27,340)	74	13.1 (43-1)	12,320 (27,160)	77	16.3 (53-5)	12,240 (26,980)	79	19.4 (63-8)	12,160 (26,810)
5.0 (16-5)	64	9.7 (31-9)	10,670 (23,520)	71	13.0 (42-7)	10,590 (23,350)	75	16.2 (53-0)	10,510 (23,170)	78	19.3 (63-4)	10,430 (22,990)
5.0 (16-5)	57	9.1 (29-10)	8,300 (18,300)	66	12.6 (41-3)	8,220 (18,120)	71	15.8 (52-0)	8,140 (17,950)	74	19.0 (62-6)	8,060 (17,770)
7.0 (23-0)	49	8.3 (27-5)	6,750 (14,880)	61	12.1 (39-7)	6,670 (14,700)	67	15.5 (50-9)	6,590 (14,530)	71	18.7 (61-5)	6,510 (14,350)
8.0 (26-3)	40	7.3 (24-0)	5,650 (12,450)	55	11.4 (37-6)	5,570 (12,280)	63	15.0 (49-2)	5,490 (12,100)	68	18.3 (60-2)	5,410 (11,930)
9.0 (29-6)	29	5.9 (19-3)	4,840 (10,670)	49	10.7 (34-11)	4,760 (10,490)	59	14.4 (47-4)	4,680 (10,320)	64	17.9 (58-9)	4,600 (10,140)
10.0 (32-10)				43	9.7 (31-9)	4,140 (9,130)	54	13.7 (45-1)	4,060 (8,950)	61	17.4 (57-0)	3,980 (8,770)
12.0 (39-4)				26	6.7 (22-0)	3,230 (7,120)	44	12.0 (39-4)	3,150 (6,940)	53	16.1 (52-8)	3,070 (6,770)
14.0 (45-11)							32	9.4 (30-10)	2,530 (5,580)	45	14.3 (46-11)	2,450 (5,400)
16.0 (52-6)										35	11.9 (39-1)	2,000 (4,410)
18.0 (59-1)												
20.0 (65-7)												
25.0 (82-0)												

- Operating radius is the horizontal distance from centerline of rotation to a vertical line through the centerline of gravity of the load.
- Rating shown are only for combination of KOBÉ manufactured upper, crawler, boom, jib and counterweights.
- Rating shown do not exceed 78% of tipping load. Deduct weight of hook, block(s), slings and all other load handling accessories from the main boom or jib rating shown.
- Boom backstops are required for all boom lengths. Boom inserts must be arranged as shown in the "Owner and Operator's Manual".
- Gantry must be in raised position for all operating condi-

- tions.
- When boom is equipped with jib, main hook ratings must be reduced by 700 kg (1,540 lbs.)
- Rating shown are based on freely suspended loads and make no allowance for such factors as wind effect on lifted load, ground conditions, out-of-level, operating speeds or any other condition that could be detrimental to the safe operation of this equipment. The operator, therefore, has the responsibility to judge the existing conditions and reduce lifted loads and operating speeds accordingly.

21.34 m (70') Boom			24.38 m (80') Boom			27.43 m (90') Boom			30.48 m (100') Boom		
Angle (°)	Boom Pt. El.	Rating	Angle (°)	Boom Pt. El.	Rating	Angle (°)	Boom Pt. El.	Rating	Angle (°)	Boom Pt. El.	Rating
79	22.4 (73-6)	10,350 (22,820)									
77	22.2 (72-10)	7,980 (17,590)	78	25.3 (83-1)	7,900 (17,420)						
74	21.9 (71-11)	6,430 (14,180)	76	25.1 (82-4)	6,350 (14,000)	78	28.2 (92-7)	6,270 (13,820)	79	31.3 (102-10)	6,190 (13,690)
71	21.6 (70-11)	5,330 (11,750)	74	24.8 (81-5)	5,250 (11,570)	75	28.0 (91-9)	5,170 (11,400)	77	31.1 (102-1)	5,090 (11,220)
68	21.2 (69-8)	4,520 (9,960)	71	24.5 (80-4)	4,440 (9,790)	73	27.7 (90-10)	4,360 (9,610)	75	30.9 (101-3)	4,280 (9,440)
65	20.8 (68-3)	3,900 (8,600)	69	24.1 (79-1)	3,820 (8,420)	71	27.4 (89-9)	3,740 (8,250)	73	30.6 (100-4)	3,660 (8,070)
59	19.7 (64-9)	2,990 (6,590)	63	23.2 (76-1)	2,910 (6,420)	67	26.6 (87-7)	2,830 (6,240)	69	29.9 (98-0)	2,750 (6,060)
53	18.4 (60-3)	2,370 (5,220)	58	22.1 (72-5)	2,290 (5,050)	62	25.6 (84-0)	2,210 (4,870)	65	29.0 (95-2)	2,130 (4,700)
46	16.6 (54-6)	1,920 (4,230)	52	20.7 (67-10)	1,840 (4,060)	57	24.4 (80-1)	1,760 (3,880)	61	28.0 (91-10)	1,680 (3,700)
37	14.3 (47-1)	1,570 (3,460)	46	18.9 (62-1)	1,490 (3,280)	52	23.0 (75-5)	1,410 (3,110)	56	26.7 (87-9)	1,330 (2,930)
27	11.1 (36-7)	1,300 (2,870)	39	16.7 (54-11)	1,220 (2,690)	46	21.2 (69-8)	1,140 (2,510)	52	25.3 (82-11)	1,060 (2,340)
						29	14.7 (48-4)	700 (1,540)	38	20.2 (66-5)	620 (1,370)

MAXIMUM JIB RATINGS IN KG (LBS.)

Offset Angle Jib to Boom Under Full Load	6.30 m (20') Jib	9.14 m (30') Jib
10°	4,540 (10,000)	3,630 (8,000)
20°	4,080 (9,000)	3,180 (7,000)
30° Max.	3,630 (8,000)	2,720 (6,000)

NOTE:

- Jib ratings at any radius from center of rotation are the same as crane ratings shown in table for main boom when operated at that radius, but do not exceed maximum jib ratings shown.
- For bucket ratings on jib, deduct 10% from maximum jib ratings.
- Maximum jib operating radius not to exceed length of main boom on which it is being used.

MAXIMUM BOOM LENGTH TO LIFT OFF GROUND

Boom Over	Boom only	Boom & Jib
Side & End	30.48 m (100')	27.43 m + 9.14 m (90' + 30')

HOIST REEVING

No. of Parts of Line	1	2	3	4	5
Max. Load—kg (lbs.)	4,540 (10,000)	9,080 (20,000)	13,620 (30,000)	18,160 (40,000)	22,500 (49,600)

BOOM MAKE-UP ARRANGEMENT CHART

Boom Length Meters (Ft.)	Boom Arrangement
12.19 (40)	BASE—A—TIP
15.24 (50)	BASE—B—TIP
18.29 (60)	BASE—A—B—TIP
21.34 (70)	BASE—B—B—TIP
24.38 (80)	BASE—A—B—B—TIP
27.43 (90)	BASE—B—B—B—TIP
30.48 (100)	BASE—A—B—B—B—TIP

BASE—4.57 m (15'); TIP—4.57 m (15')
 INSERTS: A—3.05 m (10'); B—6.10 m (20');

●GENERAL DATA

BOOM: Angle lattice alloy steel construction.
Basic length, bolt connected in two equal sections 9.14 m (30')
Open throat with offset boom point sheaves on anti-friction bearings, bottom diameter 451 mm (17.76")
12 part boom hoist reeving, standard.

GANTRY: High gantry folding type.

TAGLINE WINDER: Power operated friction disc type.

WORKING WEIGHT: (with bucket) 25,900 kg (57,100 lbs.)
(2,700 kg punchings and 2,000 kg cast removable counter-weight included in weight.)

DRUM SHAFT ASSEMBLY

Clamshell Drums	Pitch Dia.	Cable Dia.	*Line Pulls	*Line Speeds
L.H. Grooved Drum	440 mm (17.32")	20 mm (0.79")	7,450 kg (16,400 lbs.)	54 m/min (177 fpm)
R.H. Grooved Drum	440 mm (17.32")	20 mm (0.79")	7,450 kg (16,400 lbs.)	54 m/min (177 fpm)

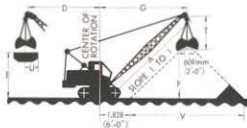
* Line Pulls and Line Speeds based on single part line in normal operating gear.

GROUND PRESSURES

Shoe Width	590 mm (24")	760 mm (30")
kg/cm ² (lbs. per sq. in.)	0.65 (9.25)	0.51 (7.25)

CLAMSHELL WORKING RANGES IN METERS (FT.-IN.)

A Boom Length	9.14 m (30')		12.19 m (40')		15.24 m (50')	
	HEIGHT AND 1/2 WIDTH OF BIN					
Operating Radius D in m (ft.-in.)	E	U	E	U	E	U
6.0 (19-8)	5.8 (19-0)	1.8 (5-11)				
7.0 (23-0)	5.1 (16-9)	2.5 (8-2)				
8.0 (26-3)	4.0 (13-1)	3.5 (11-6)	8.1 (26-7)	2.0 (6-7)		
9.0 (29-6)			7.3 (23-11)	2.5 (8-2)	11.1 (36-5)	1.8 (5-11)
10.0 (32-10)			6.2 (20-4)	3.2 (10-6)	10.4 (34-1)	2.1 (6-11)
11.0 (36-1)					9.6 (31-6)	2.6 (8-6)
12.0 (39-4)					8.6 (28-3)	3.1 (10-2)
Height and Width of Stock Pile	F	V	F	V	F	V
	4.88 (16-0)	11.28 (37-0)	7.01 (23-0)	15.54 (51-0)	9.30 (30-6)	19.81 (65-0)
G Radius	7.47 (24-6)		9.60 (31-6)		11.73 (38-6)	
T Bucket Height	Varies up to 3.00m (9'-10") depending upon make and capacity of bucket.					



CLAMSHELL RATED LOADS IN KG (LBS.)

Operating Radius in m (ft.-in.)	9.14m (30') Boom	12.19m (40') Boom	15.24m (50') Boom
6.0 (19-8)	3,630 (8,000)		
7.0 (23-0)	3,630 (8,000)		
8.0 (26-3)	3,630 (8,000)	3,630 (8,000)	
9.0 (29-6)		3,330 (7,340)	3,270 (7,210)
10.0 (32-10)		2,870 (6,330)	2,810 (6,190)
11.0 (36-1)			2,480 (5,470)
12.0 (39-4)			2,150 (4,740)

Clamshell ratings shown also apply to magnet, grapple and all other material handling buckets except dragline which is rated separately. For clamshell and magnet operations, the weight of bucket or magnet is considered a part of the load and the total weight of bucket plus contents or magnet plus load must not exceed the corresponding ratings shown. Ratings are contingent upon machine being equipped with proper PsH boom.

- Maximum boom length recommended for clamshell operation 15.24 m (50')
- Limit on clamshell rating 3,630 kg (8,000 lbs.)
- Maximum allowable heavy digging bucket size 0.8 m³ (1 cu. yd.)

Larger size may be approved depending on type of material, type of bucket—within limitations of rating charts.

NOTE: To select bucket size best suited for your application, use the following formula: Refer to charts above to obtain clamshell capacity in kgs. Clamshell capacity = (cubic meter capacity of bucket) × (weight of material per cubic meter) + (weight of specific clamshell bucket).

Dragline

0.6m³ (3/4 Cu. Yd.) / 0.8m³ (1 Cu. Yd.)
15.24m (50') max. Boom

● GENERAL DATA

BOOM: Angle lattice alloy steel construction.
Basic length, bolt connection in two equal sections ... 9.14 m (30')

With one wide throat boom point sheave on boom centerline on anti-friction bearings, bottom dia. 451 mm (17.76")
12 part boom hoist reeving, standard.

FAIRLEAD: 2 sheave, swivel caster type, anti-friction bearings. (Specify L.H. mounting.)

GANTRY: High gantry folding type.

WORKING WEIGHT: (with bucket) 25,000 kg (55,100 lbs.)
(2,700 kg punchings and 2,000 kg cast removable counterweight included in weight)

DRUM SHAFT ASSEMBLY

Dragline Drums	Pitch Dia.	Cable Dia.	*Line Pulls	*Line Speeds
L.H. Grooved Digs. Drum	440 mm (17.32")	20 mm (0.79")	7,450 kg (16,400 lbs.)	54 m/min (177 fpm)
R.H. Grooved Hoist Drum	440 mm (17.32")	20 mm (0.79")	7,450 kg (16,400 lbs.)	54 m/min (177 fpm)

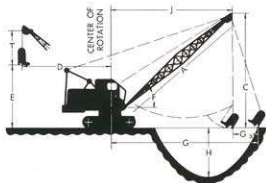
* Line Pulls and Line Speeds based on single part line in normal operating gear.

GROUND PRESSURES

Shoe Width	590 mm (24")	760 mm (30")
kg/cm ² (lbs. per sq. in.)	0.63 (8.96)	0.49 (6.97)

DRAGLINE WORKING RANGES IN METERS (FT.-IN.)

A	Boom Length	9.14 m (30')		12.19 m (40')		15.24 m (50')	
		25°	40°	25°	40°	25°	40°
F	Boom Angle						
D	Dumping Radius	9.60 (31-6)	8.38 (27-6)	12.34 (40-6)	10.67 (35-0)	15.09 (49-6)	12.95 (42-6)
E	Dumping Height (Max.)	1.37 (4-6)	3.51 (11-6)	2.74 (9-0)	5.49 (18-0)	3.96 (13-0)	7.32 (24-0)
G	Digging Reach	11.28 (37-0)	10.82 (35-6)	14.48 (47-6)	13.72 (45-0)	17.68 (58-0)	16.61 (54-6)
G _a	Casting Distance (Approx.)	1.68 (5-6)	2.44 (8-0)	2.13 (7-0)	3.05 (10-0)	2.59 (8-6)	3.66 (12-0)
H	Max. Digging Depth	3.66 (12-0)	3.35 (11-0)	5.49 (18-0)	5.18 (17-0)	6.71 (22-0)	6.40 (21-0)
C	Clearance Height of Boom Head	5.49 (18-0)	7.62 (25-0)	6.86 (22-6)	9.60 (31-6)	8.08 (26-6)	11.43 (37-6)
J	Clearance Radius of Boom Head	9.60 (31-6)	8.38 (27-6)	12.34 (40-6)	10.67 (35-0)	15.24 (50-0)	12.95 (42-6)
T	Bucket Height	Varies up to 3.81 m (12'-6") depending upon make and capacity of bucket.					



DRAGLINE RATED LOADS IN KG (LBS.)

Operating Radius in m (FT.-in.)	9.14m (30') Boom	12.19m (40') Boom	15.24m (50') Boom
8.0 (26-3)	3,180 (7,010)		
9.0 (29-6)	3,180 (7,010)		
10.0 (32-10)		3,180 (7,010)	
11.0 (36-1)		2,850 (6,280)	
12.0 (39-4)		2,470 (5,450)	2,390 (5,270)
13.0 (42-8)			2,000 (4,410)

Above ratings are combined weights of bucket and material. Ratings are contingent upon machine being equipped with proper P&H boom.

● Maximum boom length recommended for dragline operation 0.6 m³ (3/4 Cu. Yd.) 15.24 m (50')
0.8 m³ (1 Cu. Yd.) 12.19 m (40')

● Limit on dragline rating 3,180 kg (7,000 lbs.)

● Maximum allowable heavy digging bucket size 0.8 m³ (1 cu. yd.)

Larger size may be approved depending on type of material, type of bucket—within limitations of rating charts.

NOTE: To select bucket size best suited for your application, use the following formula: Refer to charts above to obtain dragline capacity in kgs. Dragline capacity = (cubic meter capacity of bucket) × (weight of material per cubic meter) + (weight of specific dragline bucket).

NOTE: Dimensions G and G_a may vary considerably depending on digging conditions and the skill of the operator. Dimension H (depth of cut) depends on the character of the digging.