

USER MANUAL
910NG
TECHNICAL SHEET

D TECHNICAL SHEET



USER MANUAL

910NG

TECHNICAL SHEET

D.1 CRANE'S TECHNICAL DATA

Versions			1S	2S	3S	4S	5S	
Max. net lifting moment			 $t\ m$ kNm	8.9 87.4	8.5 84.0	8.3 81.7	8.0 78.7	7.4 73.4
Max. dynamic moment			 $daNm$ kNm	10940 109				
Capacity at min. hydraulic outreach	hook [S2]	 kg	2125	2055	1960	1850	1700	
	grab [S1]	 kg	2125	2055	1960	1850	1700	
Max rated capacity			 m	4.17	4.17	4.25	4.33	4.40
Capacity at max. hydraulic outreach	hook [S2]	 kg	1490	1080	785	560	395	
	grab [S1]	 kg	1490	1080	785	560	395	
max.outreach			 m	5.98	7.79	9.82	11.85	14.00
Capacity of 1st man. extension	capacity	 kg	N/A	765	580	400	310	
	max.outreach	 m	N/A	9.82	11.85	14.00	16.18	
Max. load height above the base for the last extension	hydraulic	 m	8.0	9.8	11.9	13.9	16.1	
	manual	 m	N/A	13.9	16.1	18.2	18.2	
Weight of crane without stabilizers			 kg	1105	1195	1285	1370	1445
Weight of stabilizers			ST-M kg	110				
			EX-M kg	160				
			EX-H kg	190				
			SE-H kg	210				
Weight of 1st man ext.			 kg	N/A	46	40	34	23
Max. working pressure			 bar	335			330	
Max. oil flow rate			 l/min	20				
			 l/min	40				
Power needed			 kW	14.5			14.3	
			 kW	29.0			28.6	
Oil tank capacity			 l	75				
Slewing angle			 $^\circ$	425				
Gross slewing torque			 $daNm$ kNm	1060 10.6				
Max boom inclination for use with CE winch			$^\circ$	75				
Max. base inclination			$^\circ$	4				
			$^\circ$	3				
Max. stabilizer force on the ground with stabilizers fully extended	ST	daN	7370					
	EX	daN	4670					
	SE	daN	3840					
Max. stabilizer pressure on the ground with stabilizers fully extended	ST	MPa	3.66					
	EX	MPa	2.32					
	SE	MPa	1.91					
Lifting coversion factor, k			kgm/bar	31.98				
Distribution factor of dyn. moment on base, β			-	0.7				
Position of standard dead point (see D.6)								

USER MANUAL

910NG

TECHNICAL SHEET

D.2 WINCH SETTINGS

T11 - SINGLE LINE PULL

Versions	1S	2S	3S	4S	5S
 Max line pull <i>kg</i>	1000	1000	1000	1000	1000 (*)
Start angle - pull% Final angle - pull% 	-	-	-	-	75°-82% 60°-85%

N/A: configuration not available

(*): configuration requiring pull derating: available only for CE/TOP cranes (PCS)

Pull%: pull derating percentage



When the crane is equipped with winch, the max. working pressure and the limiter setting pressure are increased by 10 bar with respect to the standard ones.

D.3 TOTAL WEIGHTS

The table shows the total weights including oil inside the cylinders (fully retracted) and considering oil tank empty.

<i>kg</i>	Crane version				
Type of stabilizers	1S	2S	3S	4S	5S
ST-M	1215	1305	1395	1480	1555
EX-M	1265	1355	1445	1530	1605
EX-H	1295	1385	1475	1560	1635
SE-H	1315	1405	1495	1580	1655

Additional weight for T11 winch: 95 kg

Additional weight of 1st extra function activated with slides: 8 kg pro hydraulic extension

Additional weight of 2nd extra function activated with slides: 2 kg pro hydraulic extension

Additional weight of 1st extra function activated with hose reel: 20 kg

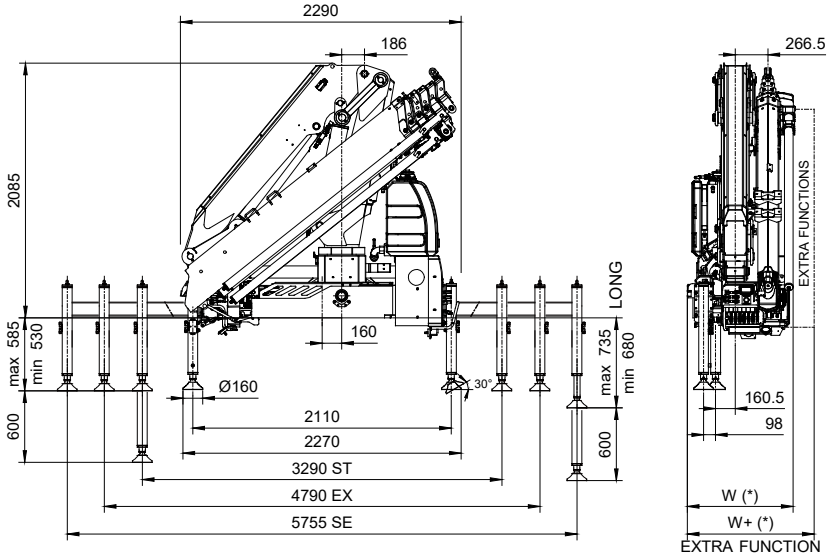
Additional weight of 2nd extra function activated with hose reel: 10 kg

The weights may vary by $\pm 3\%$

TECHNICAL SHEET

D.4 OVERALL DIMENSIONS

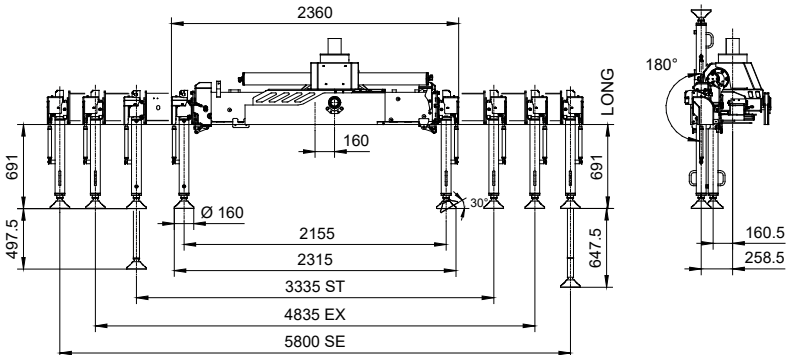
FIXED STABILIZERS LEGS



		1S	2S	3S	4S	5S
W (*) (mm)		840	840	840	840	885
W+ (*) (mm)	Compact	840	840	N/A	N/A	N/A
	Slides	885	885	885	885	N/A
	Hose reel	N/A	N/A	N/A	950	950

(*) The width has to be decreased by 40 mm in case of ST stabilisers.

TURNING STABILIZERS LEGS

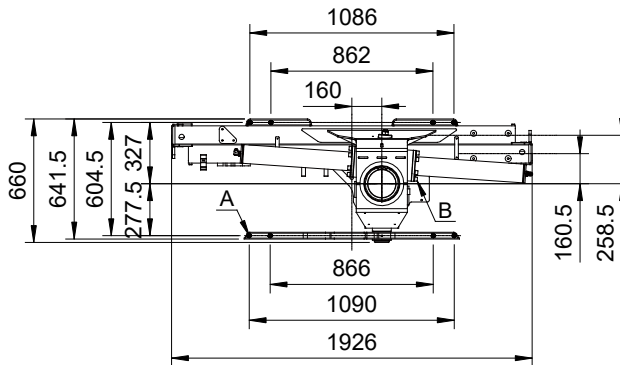


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910NG

TECHNICAL SHEET

D.5 BASE DIMENSIONS AND MOUNTING BOLTS



Ref.	Description	Q.ty	Material Grade	Size	Tightening torque
A	Kit with 8 crane mounting bolts	8	42CrMo4+QT EN 10083-3	M20x1.5 L=900	250 Nm
	Kit with 4 crane mounting bolts	4	39NiCrMo3+QT EN 10083-3	M24X2 L=520	400 Nm
B	Fixing bolts for each slewing cylinder	6	8.8	M14x2 L=65	80 Nm

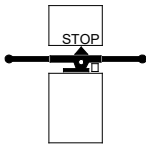
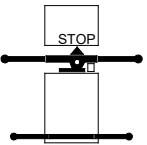
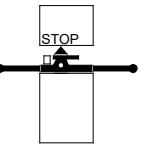
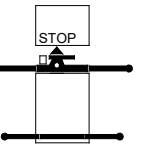
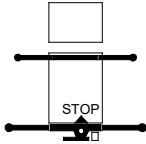
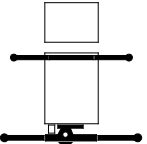
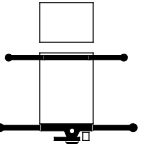
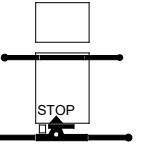
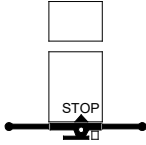
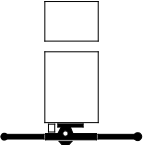
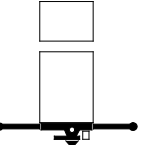
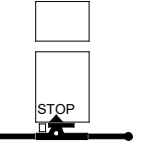
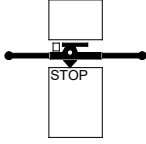
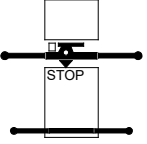
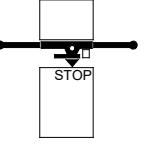
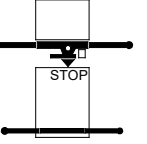
USER MANUAL

910NG

TECHNICAL SHEET

D.6INSTALLATION TYPE NUMBER

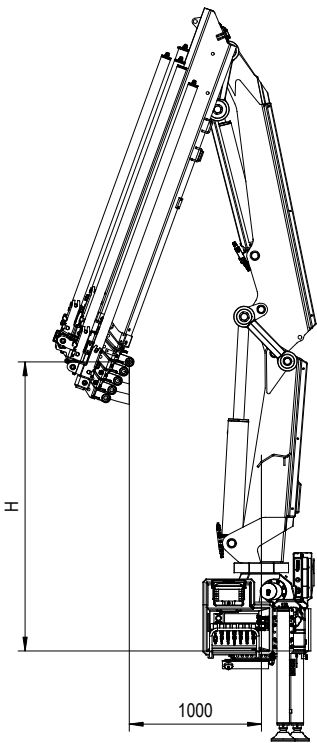
Installation types numbers (ITN) for cranes with standard dead point (STOP) toward swivel bridge.

OPPOSITE DEAD POINT		STANDARD DEAD POINT	
1 	2 	3 	4 
5 	6 	7 	8 
9 	10 	11 	12 
13 	14 	15 	16 

Legend:
▲ : position of dead point (STOP)
□ : position of main manual controls (on column side)

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910NG
TECHNICAL SHEET

D.7 LIFTING HEIGHT CLOSE TO THE COLUMN



Version	H mm
1S	1636
2S	1545
3S	1467
4S	1384
5S	1302

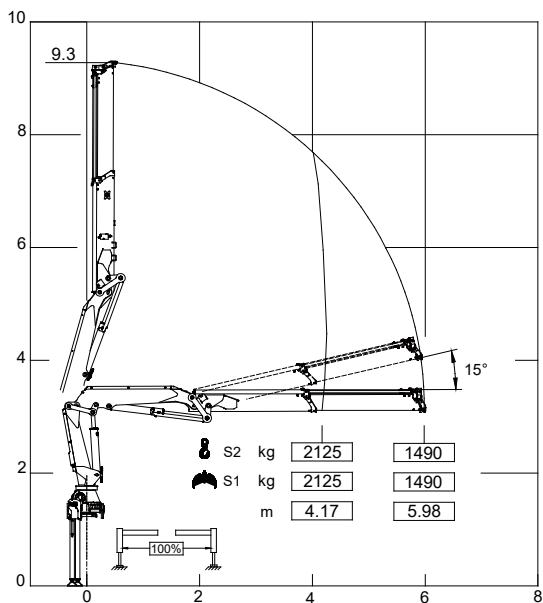
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910NG

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D.8 LOAD CHARTS FOR USE WITH HOOK/TOOL

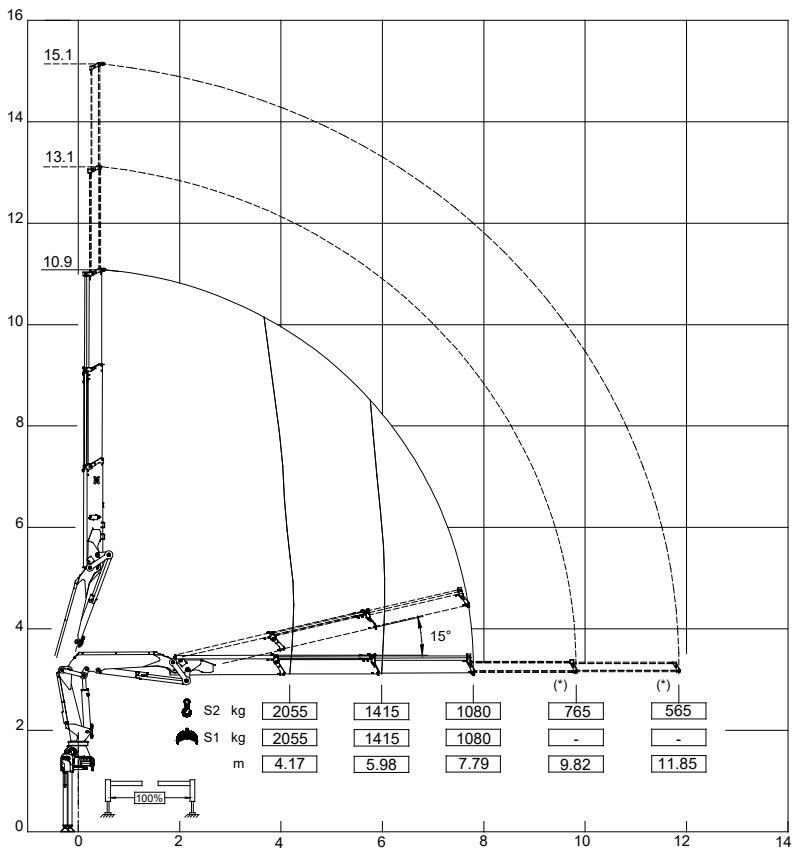
910NG 1S



If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

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910NG
TECHNICAL SHEET

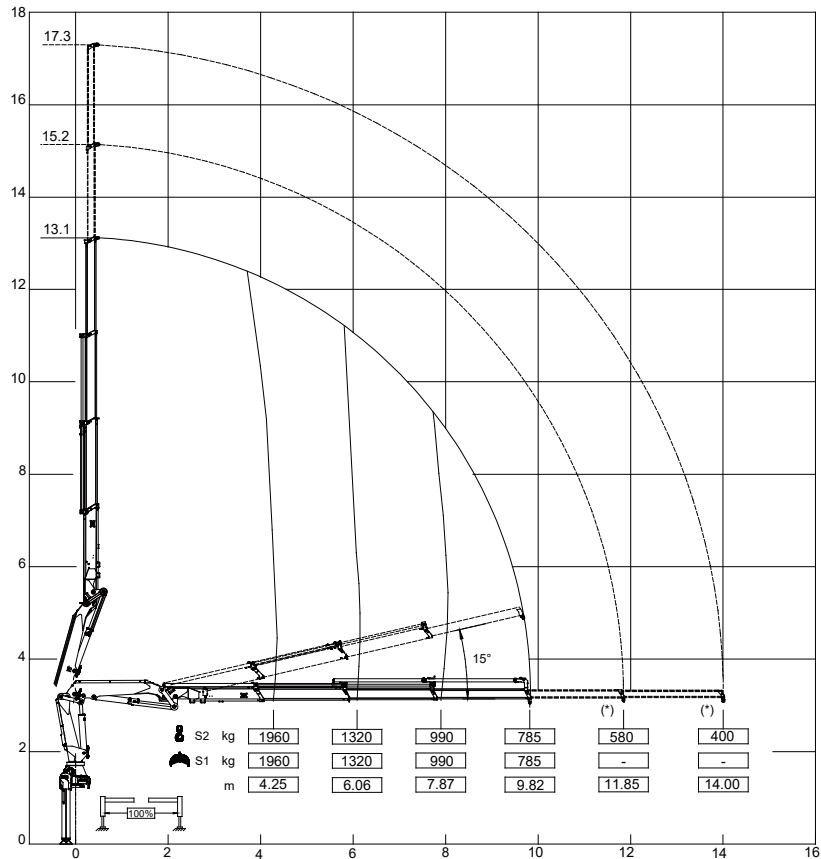
LOAD CHARTS FOR USE WITH HOOK/TOOL
910NG 2S



(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

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910NG
TECHNICAL SHEET

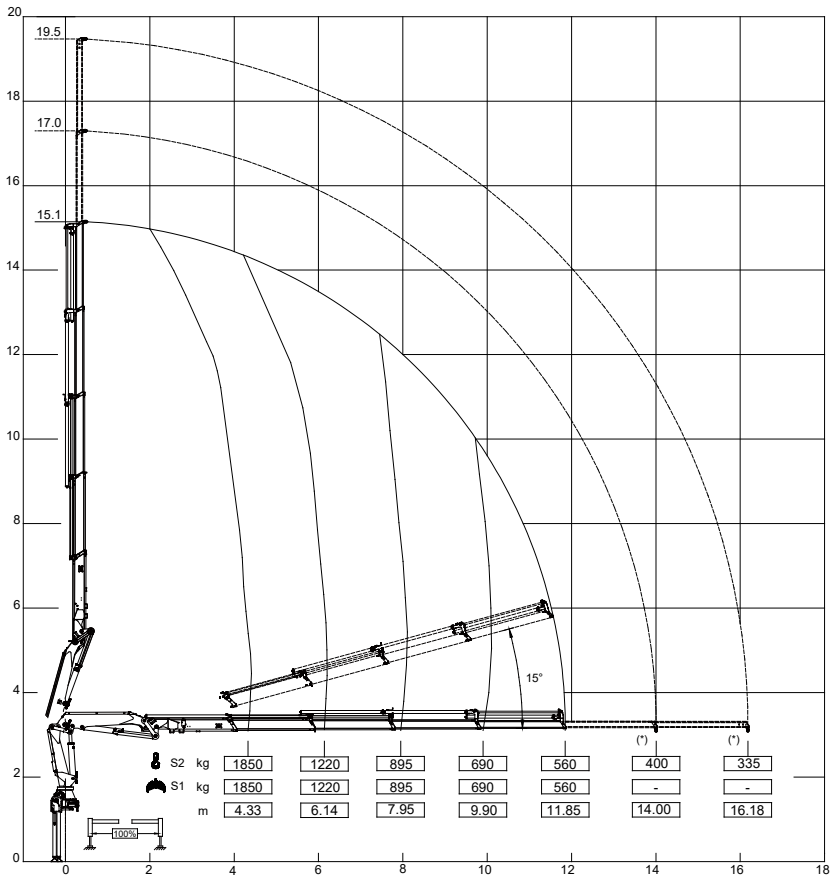
LOAD CHARTS FOR USE WITH HOOK/TOOL
910NG 3S



(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

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910NG
TECHNICAL SHEET

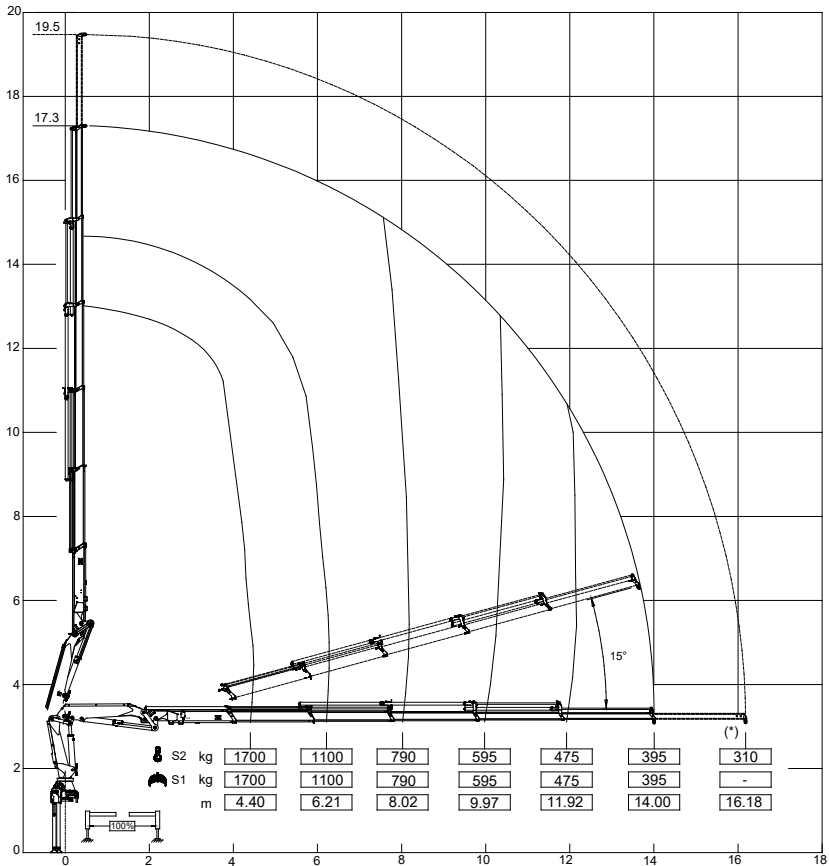
LOAD CHARTS FOR USE WITH HOOK/TOOL
910NG 4S



(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

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910NG
TECHNICAL SHEET

LOAD CHARTS FOR USE WITH HOOK/TOOL
910NG 5S



(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

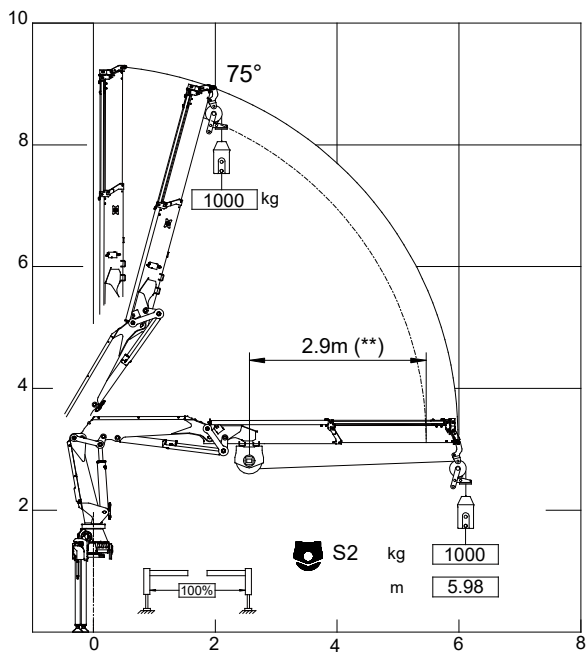
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910NG

TECHNICAL SHEET

D.9 LOAD CHARTS FOR T11 WINCH IN SINGLE LINE

910NG 1S + T11 SINGLE LINE



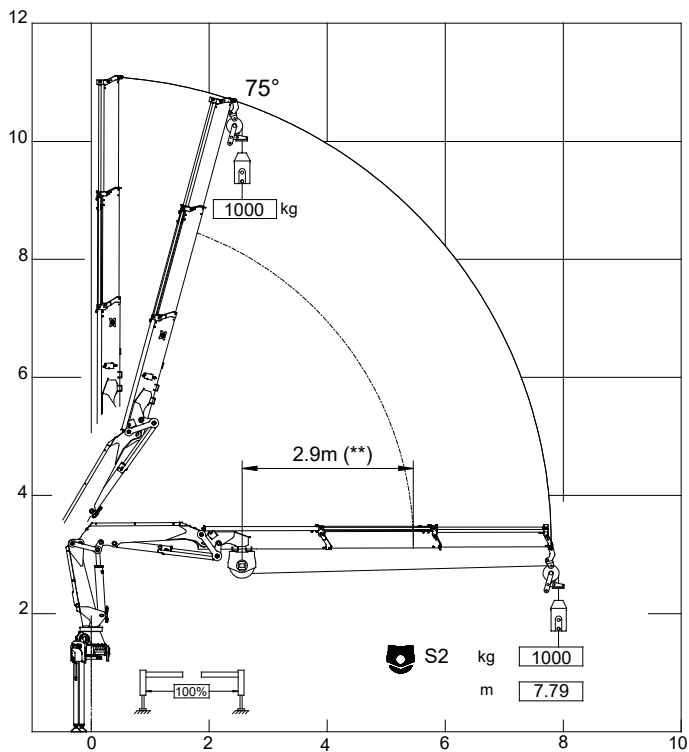
(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

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910NG

TECHNICAL SHEET

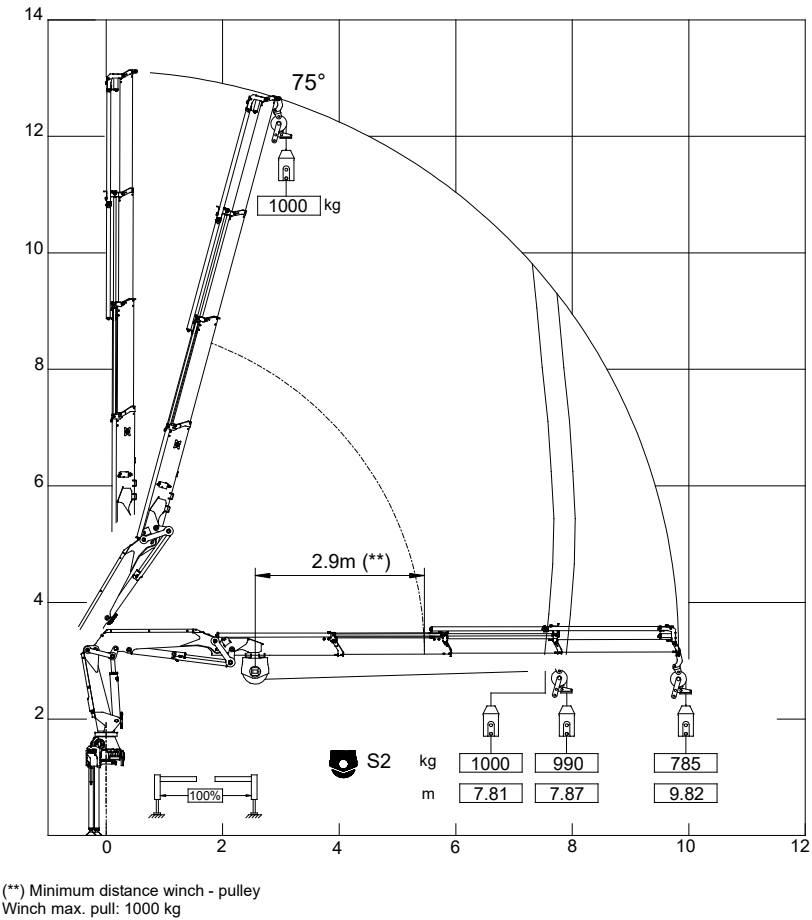
LOAD CHART FOR WINCH T11 IN SINGLE LINE 910NG 2S + T11 SINGLE LINE



(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

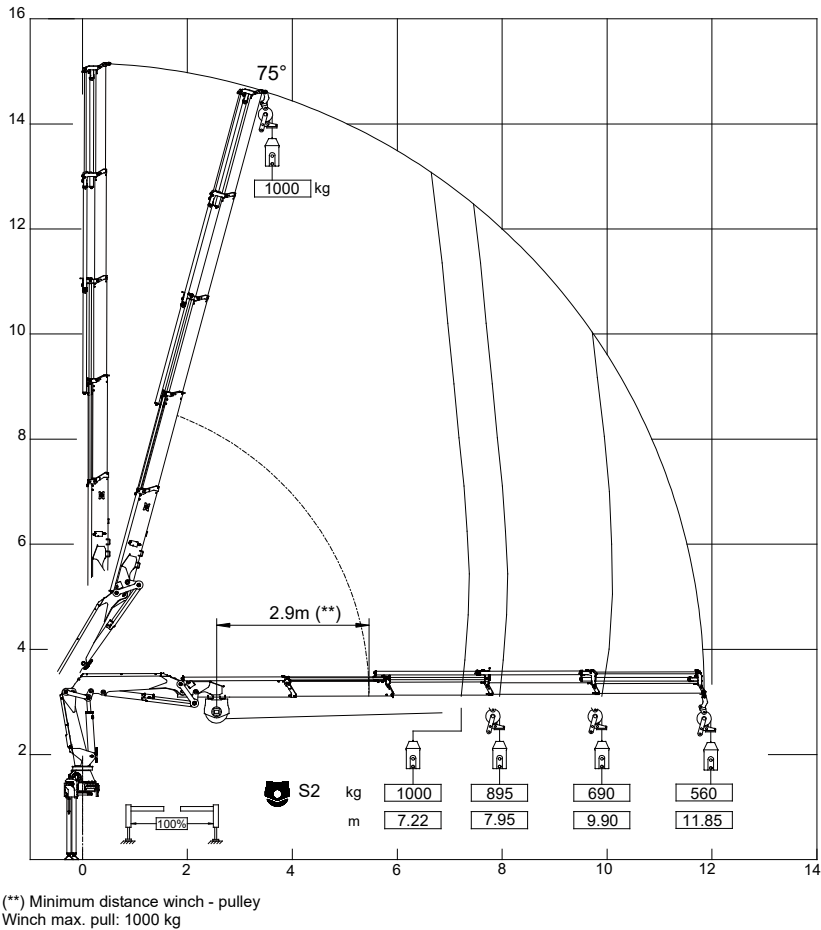
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910NG
TECHNICAL SHEET

LOAD CHART FOR WINCH T11 IN SINGLE LINE
910NG 3S + T11 SINGLE LINE



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910NG
TECHNICAL SHEET

LOAD CHART FOR WINCH T11 IN SINGLE LINE
910NG 4S + T11 SINGLE LINE

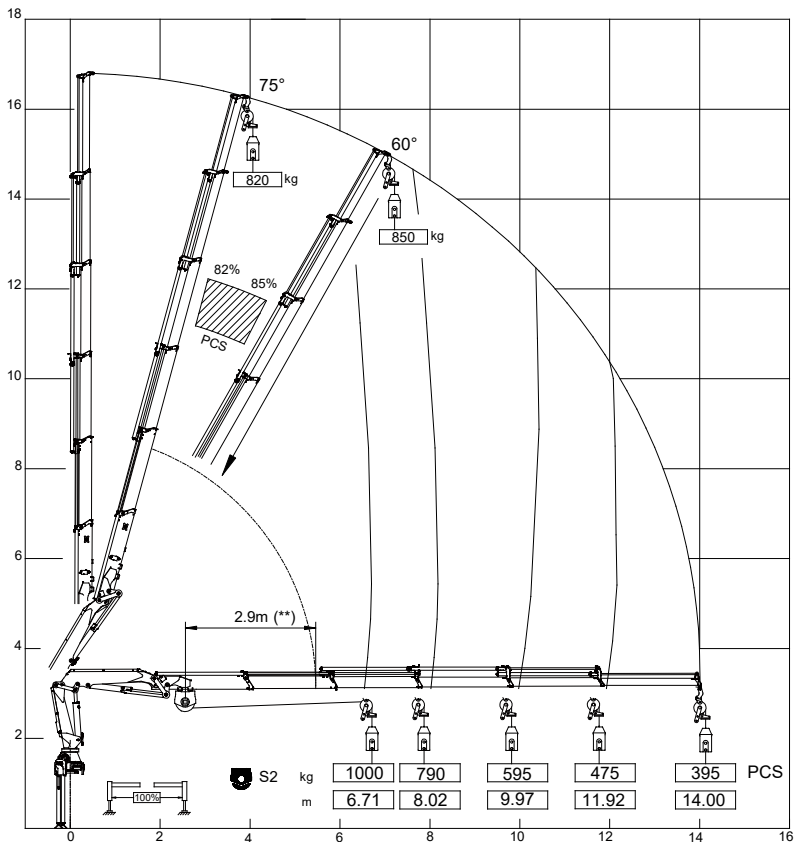


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910NG

TECHNICAL SHEET

LOAD CHART FOR WINCH T11 IN SINGLE LINE 910NG 5S + T11 SINGLE LINE



(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

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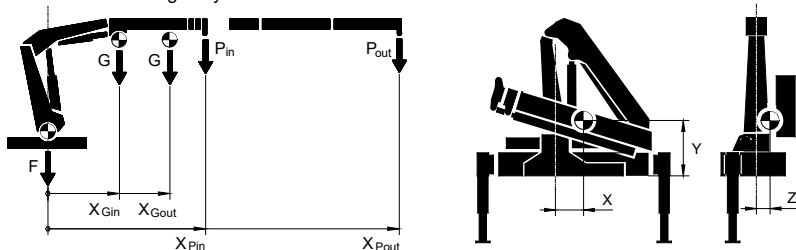
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TECHNICAL SHEET

D.10 CENTERS OF GRAVITY AND TEST LOADS

This annex contains the data needed for the stability test in accordance with EN 12999.

Loads and centers of gravity



Hooking point for the test load



Key:

F = weight of fixed parts (stabilizers, base, column, 1st boom cylinder)

G = weight of booms

X_G = distance between G and column axis

P = rated capacity

X_P = distance between P and column axis

TL = test load, to be hooked to the last hydraulic extension

X, Y, Z = coordinates of center of gravity for whole crane folded in transport position (EX-H version)

in = configuration with all hydraulic extensions fully retracted

out = configuration with all hydraulic extensions fully extracted

WEIGHTS AND CENTERS OF GRAVITY

910NG	F kg	G kg	X_G in / out m	P in / out kg	X_P in / out m	TL kg	X	Y	Z
1S	ST-M : 795 EX-M : 845 EX-H : 875 SE-H : 895	415	2.06 2.38	2125 1490	4.17 5.98	1863	162	702	14
2S		510	2.23 3.09	2055 1080	4.17 7.79	1350	159	726	35
3S		600	2.36 3.84	1960 785	4.25 9.82	989	150	746	52
4S		680	2.45 4.60	1850 560	4.33 11.85	725	142	762	62
5S		760	2.53 5.65	1700 395	4.40 14.00	535	134	778	77

The data are relating to crane configuration with horizontal booms.

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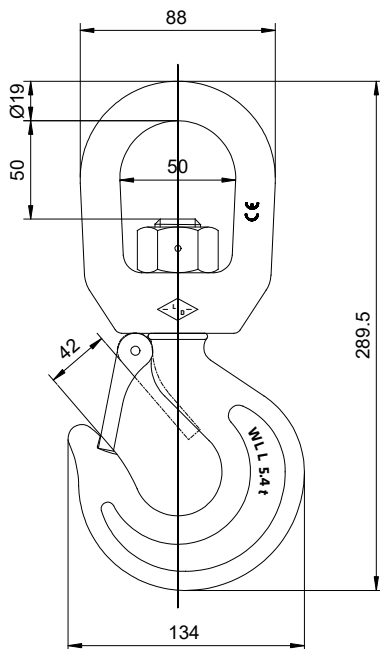
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TECHNICAL SHEET

D.11 HOOK DATA

HOOK MOUNTED ON STANDARD BOOM
VERSIONS: 1S, 2S, 3S, 4S, 5S

DIMENSIONS



TECHNICAL PROPERTIES

Working load limit (WLL) : 5400 kg

Material: alloy steel

Weight: 3.2 kg

Swivel hook

Reference standard: DIN 15401

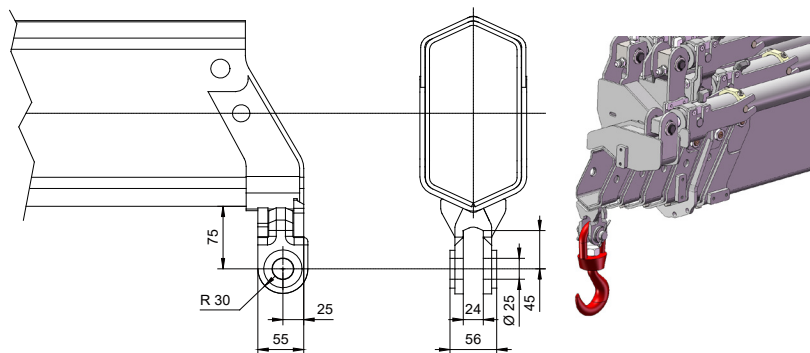
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910NG

TECHNICAL SHEET

D.12 LOAD ATTACHMENT

ATTACHMENT FOR HOOK



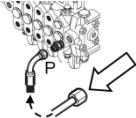
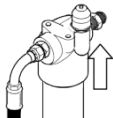
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910NG

TECHNICAL SHEET

D.13 HYDRAULIC SYSTEM

FITTINGS FOR CONNECTION TO PUMP

910NG	NO RDC	RDC
Control valve pressure line	 M 7/8"-14 JIC	 M 3/4"-16 GAS
Tank suction line	 M 1"1/2 BSP	 M 1" 1/2 BSP

EXTENSION TIMES OF HYDRAULIC CYLINDERS

910NG	Extension time s	Retraction time s
Slewing (180°)	20	20
1.boom cylinder	N/A	N/A
2.boom cylinder	N/A	N/A
boom extension 1S (SGS active)	N/A	N/A
boom extension 2S (SGS active)	N/A	N/A
boom extension 3S (SGS active)	N/A	N/A
boom extension 4S (SGS active)	N/A	N/A
boom extension 5S (SGS active)	N/A	N/A

Times are indicative and referring to the following operating conditions:

- unloaded crane operated with a single control lever
- oil flow rate recommended for NO RDC crane
- ISO VG 46 oil at a temperature of 50°C

MAX. ALLOWABLE SINK RATE FOR THE LOAD

The sink rate is the uncontrolled descent of the load in a given time interval due to internal leakage of hydraulic components. The table below shows the maximum permitted descent of the rated load, at the max. hydraulic outreach and in the given time interval.

910NG	Time interval min.	Max. load descent mm
1S	10	299
2S	10	390
3S	10	491
4S	10	593
5S	10	280

USER MANUAL

910NG

TECHNICAL SHEET

CAPACITY OF HYDRAULIC SYSTEM

910NG	Cylinders extended ℓ	Cylinders retracted ℓ
1S	28	19
2S	34	23
3S	41	27
4S	47	32
5S	53	36

Capacities do not include the oil tank.

ADDITIONAL CAPACITY FOR HYDRAULICALLY OPERATED STABILIZER EXTENSIONS

EX-H	+3.5	+2.0
SE-H	+4.5	+3.0

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910NG

TECHNICAL SHEET

D.14 OIL COOLER



TECHNICAL SPECIFICATIONS

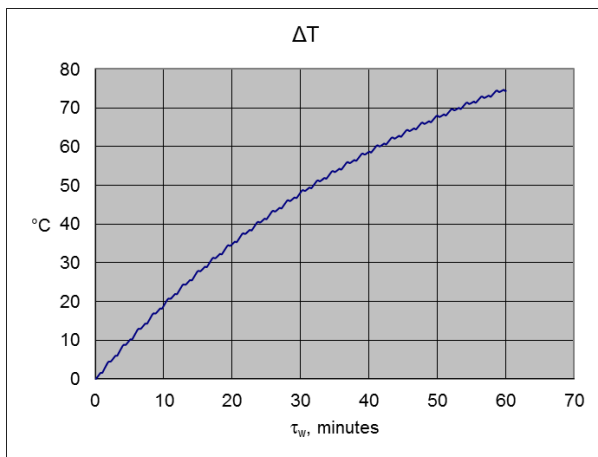
Heat transfer coefficient: 235 W/K (oil flow rate of 40 l/min)

Activation temperature: 48 °C

Weight: 13.5 kg

Capacity: 4 l

For a crane without oil cooler performing a sequence of standard work cycles, the difference in temperature between the oil and the environment is shown in the graph below.



The oil cooler is recommended when

$$T_{\text{env}} + \tau_w > 57$$

where:

T_{env} : temperature of the environment (°C)

ΔT : difference in temperature between the oil and the environment (°C)

τ_w : working time (minutes)

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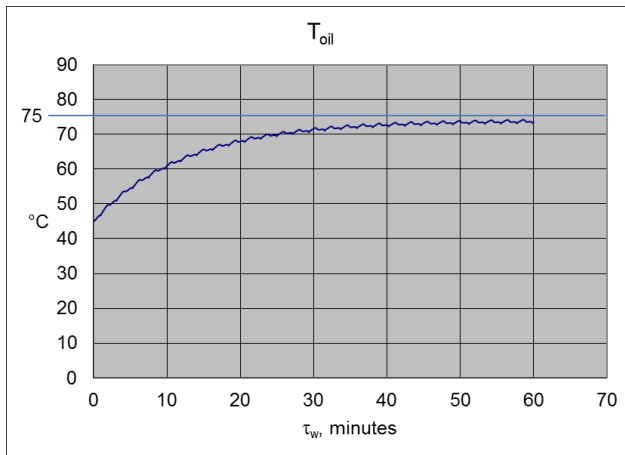
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TECHNICAL SHEET

However, when a crane equipped with oil cooler carries out a sequence of standard work cycles, the oil temperature exceeds 75 °C after the following working times:

T_{env} (°C)	τ_w to exceed 75 °C (minutes)
45	no limit
48	35
50	25
52	20
54	15

The graph below shows the temperature trend (T_{oil}) with oil cooler when $T_{env} = 45$ °C.



Notes:

The max recommended oil temperature is 75°C (at 80°C you must stop working)

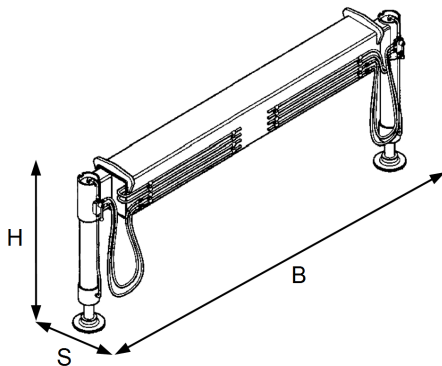
The calculation of the oil temperature is purely indicative and depending on several variables (e.g. working cycle, wind, humidity, weather, etc.)

USER MANUAL

910NG

TECHNICAL SHEET

D.15 ADDITIONAL STABILIZERS



Additional stabilizers must be chosen so that:

- the installation is stable (see Installer Manual)
- the max. force acting on the additional stabilizers, F_s , is lower than the max. load allowed by the stabilizers itself, R_{max} .

$$F_s = M_{dyn} / X_s \quad F_s \geq 0.6 F_{sg}$$

where:

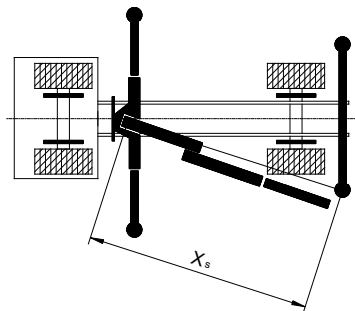
M_{dyn} : max. dynamic moment of the crane

X_s : distance between column axis - stab. cylinder

F_{sg} : max force on stabilizer leg

Check that: $F_s \leq R_{max}$

R_{max} is given in the technical specifications of the additional stabilizers.



- In addition, CE additional stabilizer must be equipped with safety devices integrated with the crane's stability control system. Therefore we recommend to install the following models designed by the crane's manufacturer:

Code	Spread (m)	Weight (kg)	R_{max} (kg)	Overall dimensions BxHxS (mm)
7850088	2.00	155	6250	2160x770x190
7850086	3.32	220	6250	2285x780x240
7850087	3.32	235	6250	2285x780x240

For further information see the User Manual for outriggers.

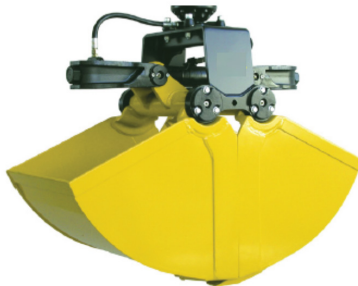
USER MANUAL

910NG

TECHNICAL SHEET

D.16 RECOMMENDED ADDITIONAL LIFTING TOOLS

CLAMSHELL BUCKET



Crane version	Gross load kg ⁽¹⁾	Data of recommended tool				Payload kg ⁽³⁾	Load ratio	
		HYVA model	weight kg	volume dm ³	capacity kg ⁽²⁾		crane ⁽⁴⁾	tool ⁽⁵⁾
1S	1490	H605-550	375	550	825	1115	81%	100%
2S	1080	H605-450	340	450	675	740	94%	100%
3S	785	H605-250	285	250	375	500	84%	100%
4S	560	H604-200	195	200	300	365	88%	100%
5S	395	H604-150	185	150	225	210	100%	93%

Notes

⁽¹⁾ The gross load is the load capacity of crane at maximum hydraulic outreach

⁽²⁾ The tool's load capacity is calculated multiplying the volume by a density of 1.5 kg/dm³

⁽³⁾ The payload is the gross load of crane minus the tool's weight

⁽⁴⁾ The crane's load ratio is the percentage value of the liftable load with respect to the gross load

⁽⁵⁾ The tool's load ratio is the percentage value of the liftable load with respect to tool's capacity

Stress history class: S1

USER MANUAL

910NG

TECHNICAL SHEET

RECOMMENDED ADDITIONAL LIFTING TOOLS ORANGE PEEL GRAPPLE



Crane version	Gross load kg ⁽¹⁾	Data of recommended tool				Payload kg ⁽³⁾	Load ratio	
		HYVA model	weight kg	volume dm ³	capacity kg ⁽²⁾		crane ⁽⁴⁾	tool ⁽⁵⁾
1S	1490	H653-4 large	435	500	750	1055	80%	100%
2S	1080	H653-4 large	395	350	525	685	85%	100%
3S	785	H652-5 large	250	390	585	535	100%	91%
4S	560	H653-4 small	275	120	180	285	81%	100%
5S	395	H652-5 small	230	120	180	165	100%	92%

Notes

- ⁽¹⁾ The gross load is the load capacity of crane at maximum hydraulic outreach
- ⁽²⁾ The tool's load capacity is calculated multiplying the volume by a density of 1.5 kg/dm³
- ⁽³⁾ The payload is the crane's gross load minus the tool's weight
- ⁽⁴⁾ The crane's load ratio is the percentage value of the liftable load with respect to the gross load
- ⁽⁵⁾ The tool's load ratio is the percentage value of the liftable load with respect to tool's capacity

Stress history class: S1

USER MANUAL
910NG
TECHNICAL SHEET

RECOMMENDED ADDITIONAL LIFTING TOOLS
LOGGING GRAPPLE



Crane version	Gross load kg ⁽¹⁾	Data of recommended tool			Payload kg ⁽²⁾	Load ratio	
		HYVA model	weight kg	capacity kg		crane ⁽³⁾	tool ⁽⁴⁾
1S	1490	H634-0,25	170	4000	1320	100%	33%
2S	1080	H634-0,25	170	4000	910	100%	23%
3S	785	H634-0,25	170	4000	615	100%	15%
4S	560	H634-0,25	170	4000	390	100%	10%
5S	395	H634-0,25	170	4000	225	100%	6%

Notes

- ⁽¹⁾ The gross load is the load capacity of crane at maximum hydraulic outreach
- ⁽²⁾ The payload is the gross load of crane minus the tool's weight
- ⁽³⁾ The crane's load ratio is the percentage value of the liftable load with respect to the gross load
- ⁽⁴⁾ The tool's load ratio is the percentage value of the liftable load with respect to tool's capacity

Stress history class: S1

USER MANUAL

910NG

TECHNICAL SHEET

RECOMMENDED ADDITIONAL LIFTING TOOLS BRICK STACK GRAPPLE



Crane version	Gross load kg ⁽¹⁾	Data of recommended tool			Payload kg ⁽²⁾	Load ratio	
		HYVA model	weight kg	capacity kg		crane ⁽³⁾	tool ⁽⁴⁾
1S	1490	H332-1330	265	1600	1225	100%	77%
2S	1080	H332-1330	265	1600	815	100%	51%
3S	785	H332-1330	265	1600	520	100%	33%
4S	560	H332-1330	265	1600	295	100%	18%
5S	395	H332-850	245	2200	150	100%	7%

Notes

⁽¹⁾ The gross load is the load capacity of crane at maximum hydraulic outreach

⁽²⁾ The payload is the gross load of crane minus the tool's weight

⁽³⁾ The crane's load ratio is the percentage value of the liftable load with respect to the gross load

⁽⁴⁾ The tool's load ratio is the percentage value of the liftable load with respect to tool's capacity

Stress history class: S2

USER MANUAL

910NG

TECHNICAL SHEET

RECOMMENDED ADDITIONAL LIFTING TOOLS PALLET FORK



Crane version	Gross load kg ⁽¹⁾	Data of recommended tool			Payload kg ⁽²⁾	Load ratio	
		HYVA model	weight kg	capacity kg		crane ⁽³⁾	tool ⁽⁴⁾
1S	1490	H415 2000-500	155	2000	1335	100%	67%
2S	1080	H415 2000-500	155	2000	925	100%	46%
3S	785	H415 1500-500	135	1500	650	100%	43%
4S	560	H415 1500-500	135	1500	425	100%	28%
5S	395	H415 1500-500	135	1500	260	100%	17%

Notes

- ⁽¹⁾ The gross load is the load capacity of crane at maximum hydraulic outreach
- ⁽²⁾ The payload is the gross load of crane minus the tool's weight
- ⁽³⁾ The crane's load ratio is the percentage value of the liftable load with respect to the gross load
- ⁽⁴⁾ The tool's load ratio is the percentage value of the liftable load with respect to tool's capacity

Stress history class: S2