D TECHNICAL SHEET

D.1 CRANE'S TECHNICAL DATA

Versions				1S	2S	3S	4S	5S
Max. net lifting moment			*t m* *kNm*	10.2 100.2	9.9 96.9	9.4 92.5	9.0 88.7	8.7 85.9
Max. dynamic moment			*daNm* *kNm*	12460 124.6				
Capacity at min. hydraulic outreach Max rated capacity	hook [S2]		*kg*	2450	2370	2220	2090	1990
	grab [S1]		*kg*	2450	2370	2220	2090	1990
	min. outreach		*m*	4.17	4.17	4.25	4.33	4.40
Capacity at max. hydraulic outreach	hook [S2]		*kg*	1705	1225	880	640	465
	grab [S1]		*kg*	1705	1225	880	640	465
	max.outreach		*m*	5.98	7.79	9.82	11.85	14.00
Capacity of 1st man. extension	capacity		*kg*	N/A	880	640	460	370
	max.outreach		*m*	N/A	9.82	11.85	14.00	16.19
Max. load height above the base for the last extension	hydraulic		*m*	8.1	9.9	11.9	13.9	16.1
	manual		*m*	N/A	13.9	16.1	18.3	18.3
Weight of crane without stabilizers			*kg*	1155	1265	1370	1465	1555
Weight of stabilizers		ST-M	*kg*	160				
		EX-M	*kg*	220				
		EX-H	*kg*	250				
		SE-H	*kg*	270				
Weight of 1st man ext.			*kg*	N/A	59	51	49	30
Max. working pressure			*bar*	315	320			
Max. oil flow rate			*ℓ/min*	20				
			ℓ/min	40				
Power needed			*kW*	13.7	13.9			
			kW	27.3	27.7			
Oil tank capacity			*ℓ*	75				
Slewing angle			°	425				
Gross slewing torque			*daNm* *kNm*	1730 17.3				
Max boom inclination for use with CE winch			°	75				
Max. base inclination			°	4				
			°	3				
Max. stabilizer force on the ground with stabilizers fully extended		ST	*daN*	8360				
		EX	*daN*	5550				
		SE	*daN*	4570				
Max. stabilizer pressure on the ground with stabilizers fully extended		ST	*MPa*	3.29				
		EX	*MPa*	2.18				
		SE	*MPa*	1.80				
Lifting conversion factor, k			*kgm/bar*	37.78				
Distribution factor of dyn. moment on base, β			-	0.7				
Position of standard dead point (see D.6)			▲					

D.2 WINCH SETTINGS

TI1 - SINGLE LINE PULL

Versions	1S	2S	3S	4S	5S
Max line pull *kg*	1000	1000	1000	1000	1000 (*)
Start angle - pull% Final angle - pull%	-	-	-	-	75°-82% 57°-88%

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

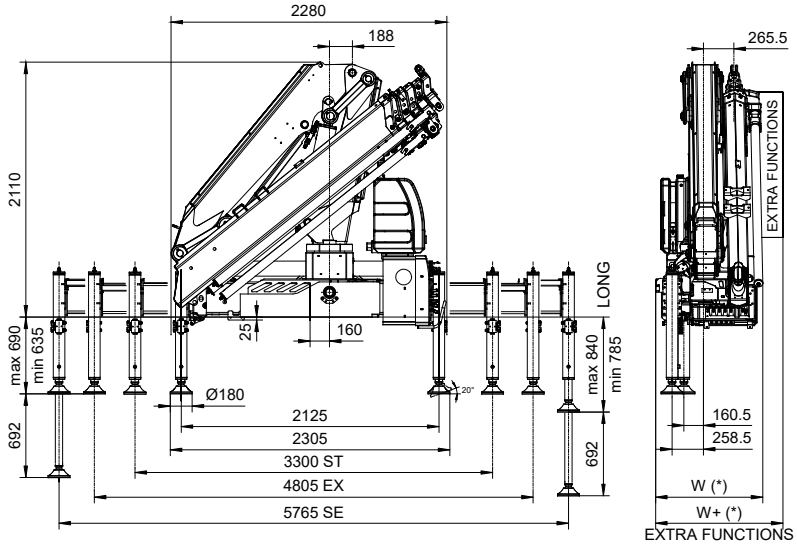
The table shows the total weights including oil inside the cylinders (fully retracted) and considering oil tank empty.

kg	Crane version				
Type of stabilizers	**1S**	**2S**	**3S**	**4S**	**5S**
ST-M	1315	1425	1530	1625	1715
EX-M	1375	1485	1590	1685	1775
EX-H	1405	1515	1620	1715	1805
SE-H	1425	1535	1640	1735	1825

Additional weight for TI1 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 ± 3%

D.4 OVERALL DIMENSIONS

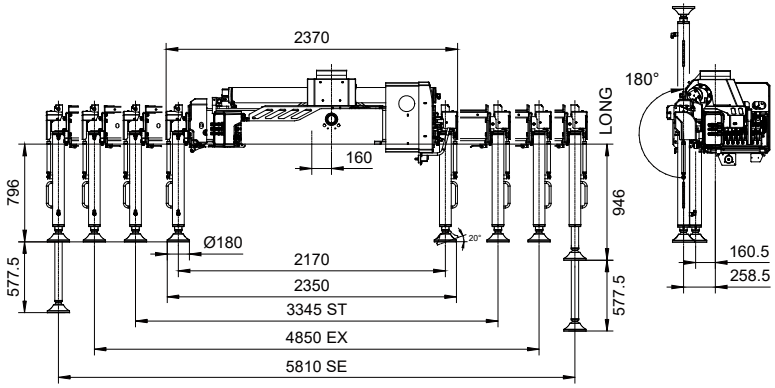
FIXED STABILIZERS LEGS



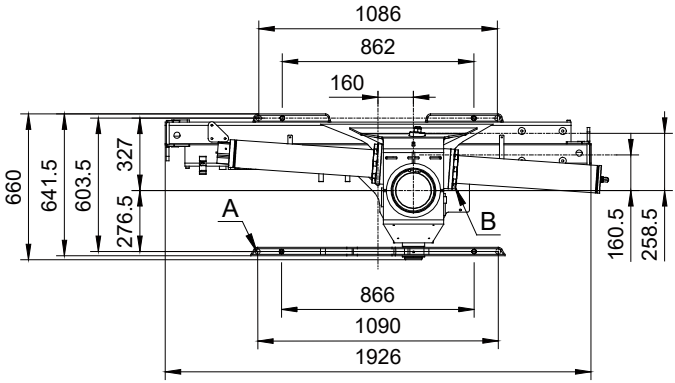
		1S	2S	3S	4S	5S
W (*) (mm)		840	840	840	840	885
W+ (*) (mm)	Compact	840	840	N/A	N/A	N/A
	Slides	885	885	885	885	N/A
	Hose reel	N/A	N/A	N/A	950	950

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

TURNING STABILIZERS LEGS



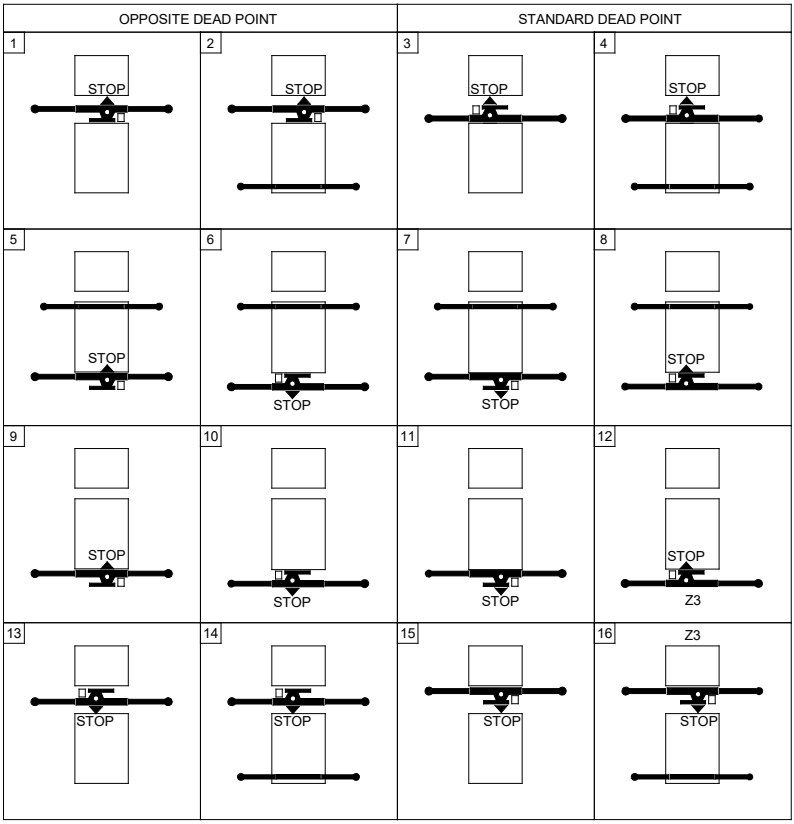
D.5 BASE DIMENSIONS AND MOUNTING BOLTS



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	8	8.8	M14x2 L=65	80 Nm

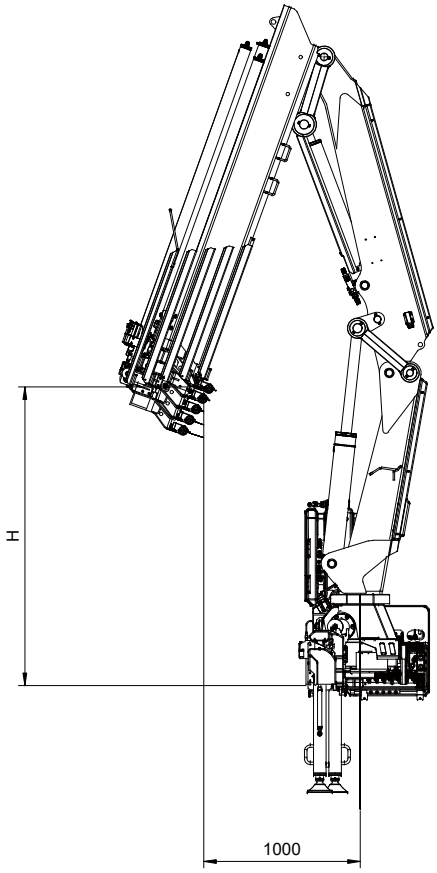
D.6 INSTALLATION TYPE NUMBER

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



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

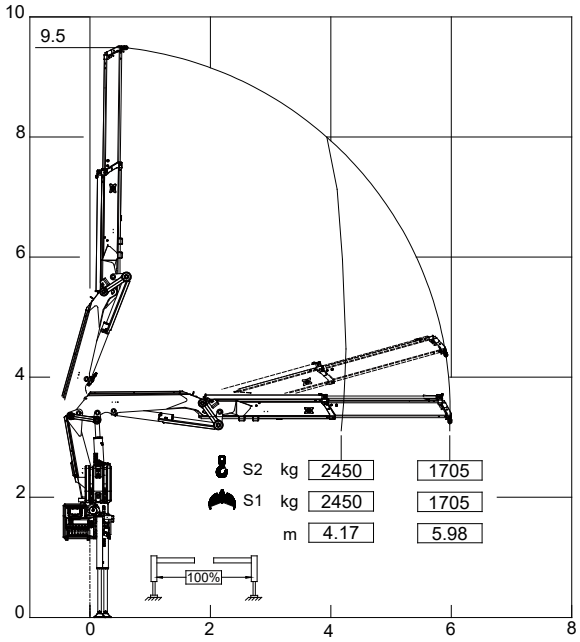
D.7 LIFTING HEIGHT CLOSE TO THE COLUMN



Version	H mm
1S	1831
2S	1831
3S	1755
4S	1675
5S	1595

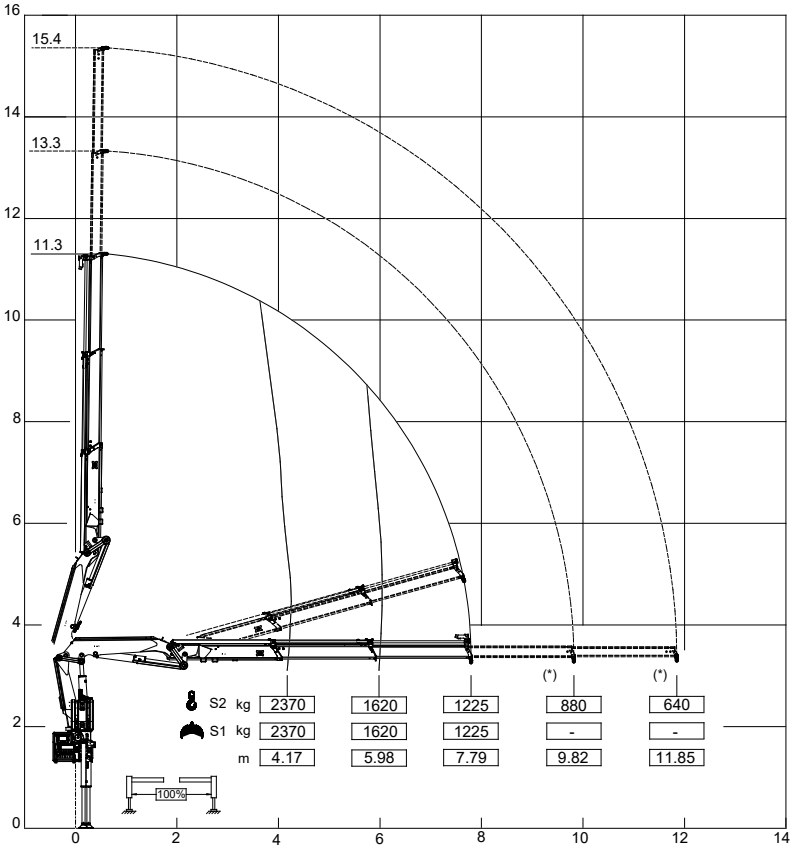
D.8 LOAD CHARTS FOR USE WITH HOOK/TOOL

911NG 1S



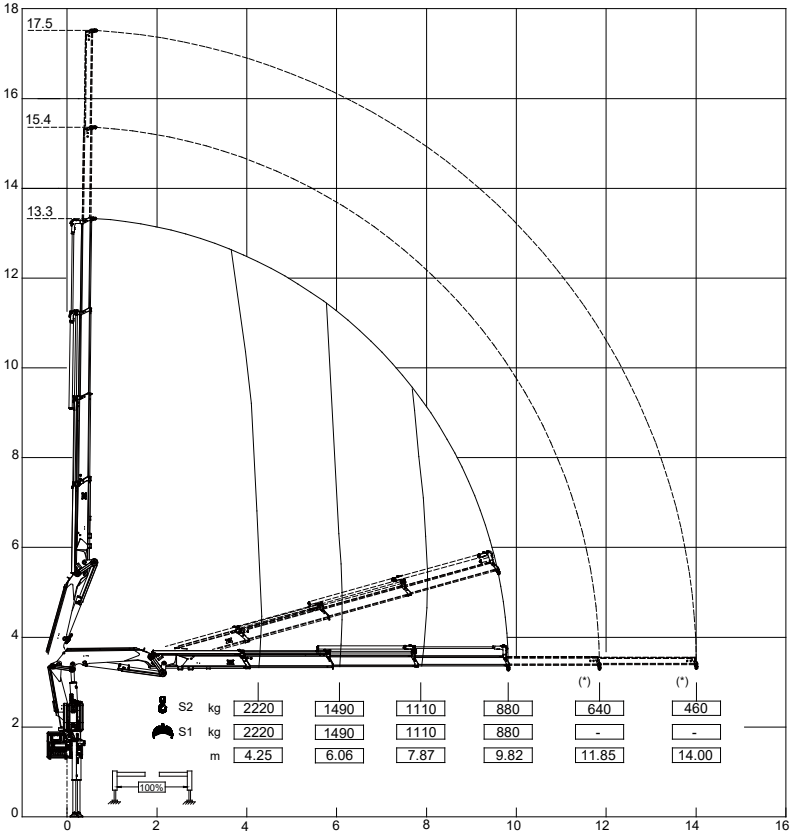
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

LOAD CHARTS FOR USE WITH HOOK/TOOL
911NG 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

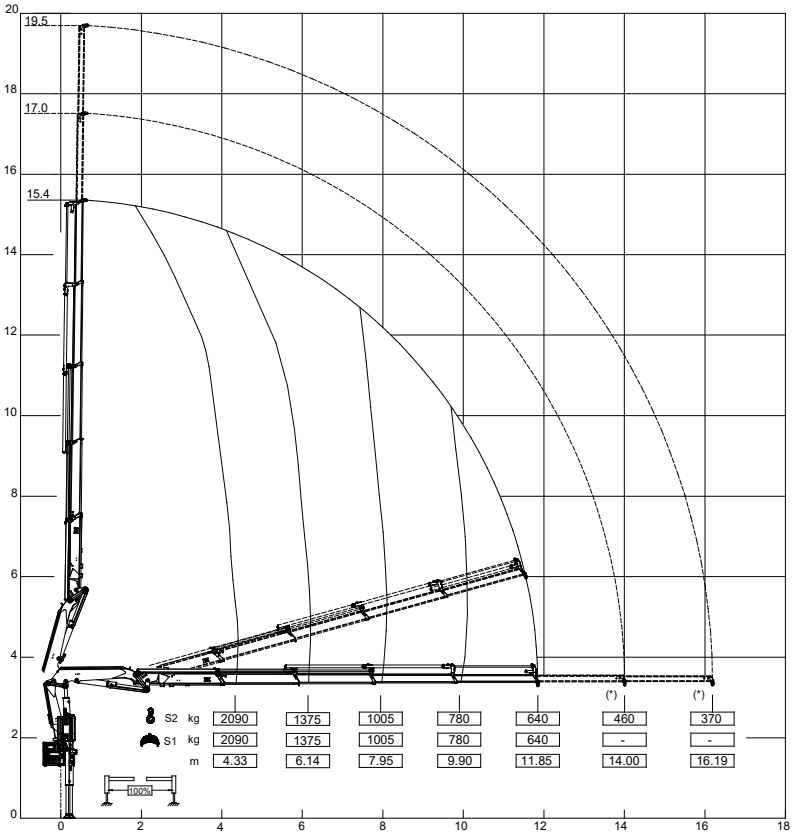
LOAD CHARTS FOR USE WITH HOOK/TOOL
911NG 3S



						(*)	(*)
S2	kg	2220	1490	1110	880	640	460
S1	kg	2220	1490	1110	880	-	-
	m	4.25	6.06	7.87	9.82	11.85	14.00

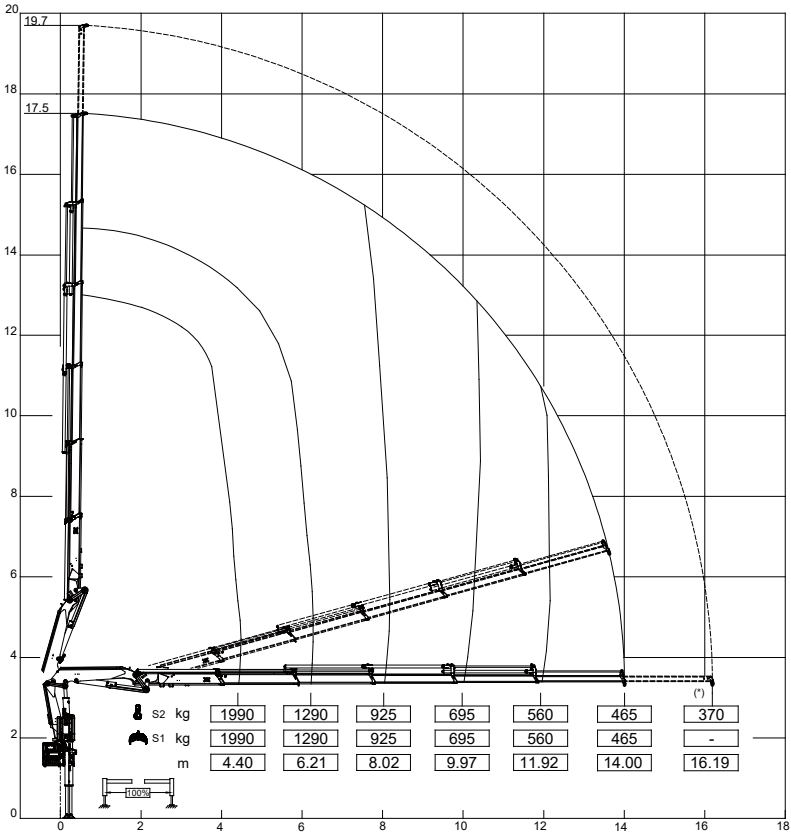
(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

LOAD CHARTS FOR USE WITH HOOK/TOOL
911NG 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

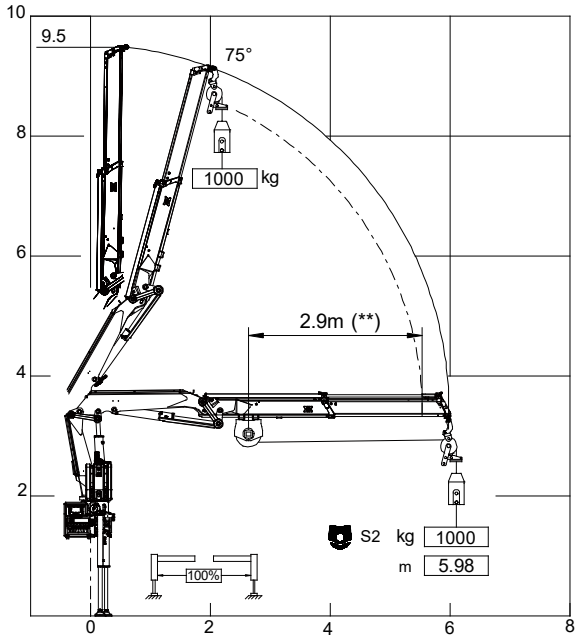
LOAD CHARTS FOR USE WITH HOOK/TOOL
911NG 5S



(*) 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

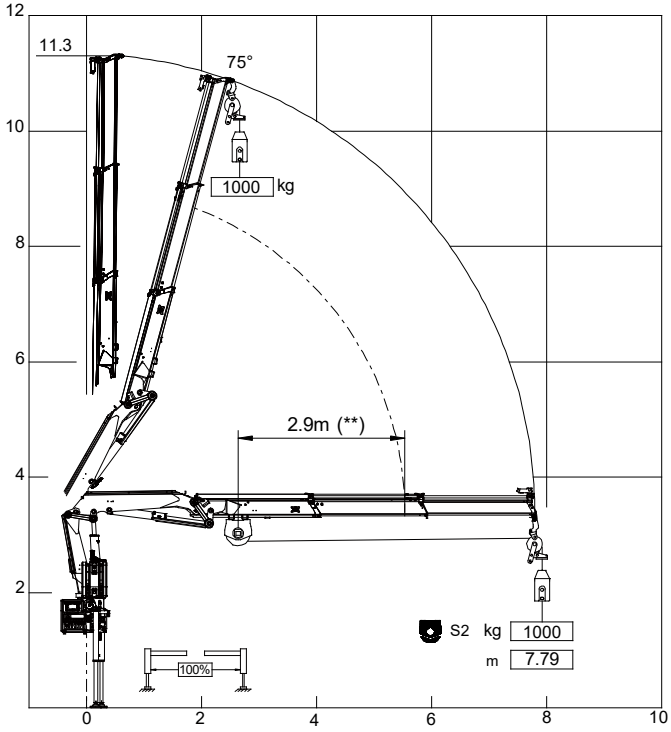
D.9 LOAD CHARTS FOR TI1 WINCH IN SINGLE LINE

911NG 1S + TI1 SINGLE LINE



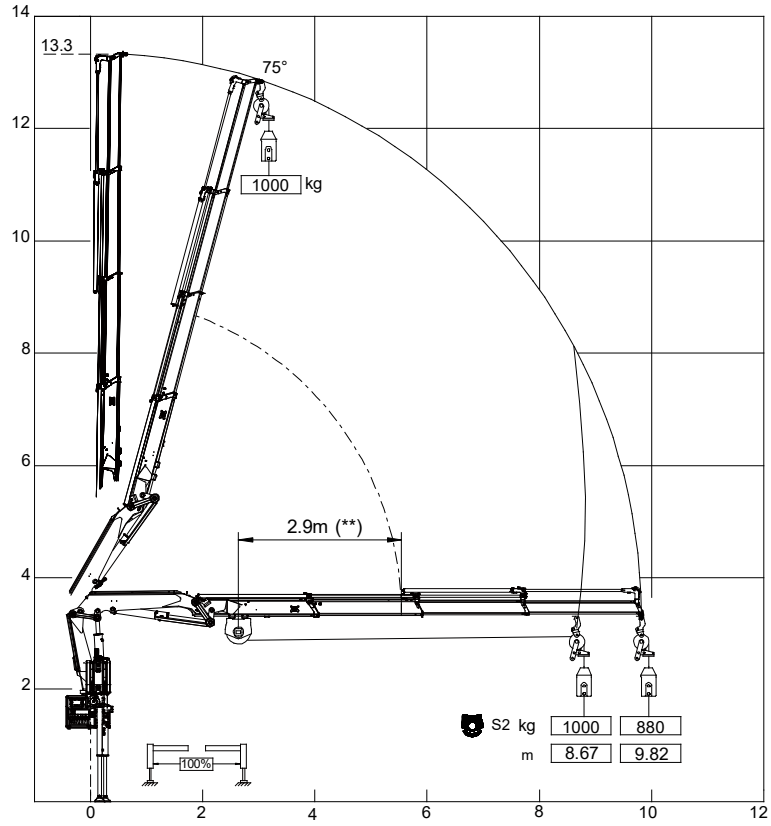
(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

LOAD CHART FOR WINCH TI1 IN SINGLE LINE
911NG 2S + TI1 SINGLE LINE



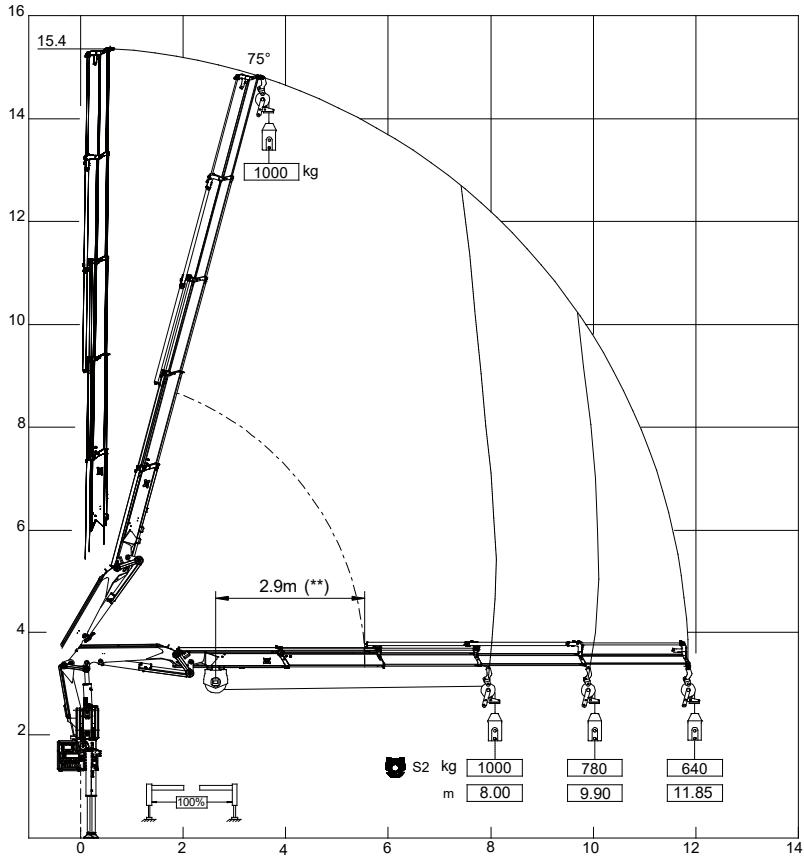
(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

LOAD CHART FOR WINCH TI1 IN SINGLE LINE
911NG 3S + TI1 SINGLE LINE



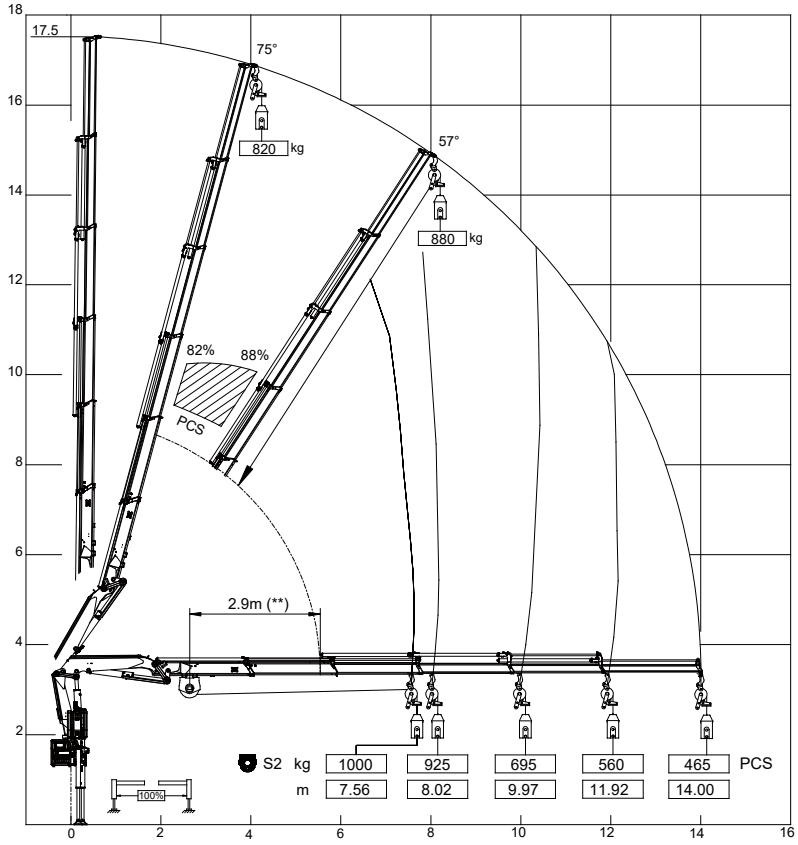
(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

LOAD CHART FOR WINCH TI1 IN SINGLE LINE
911NG 4S + TI1 SINGLE LINE



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

LOAD CHART FOR WINCH TI1 IN SINGLE LINE
911NG 5S + TI1 SINGLE LINE

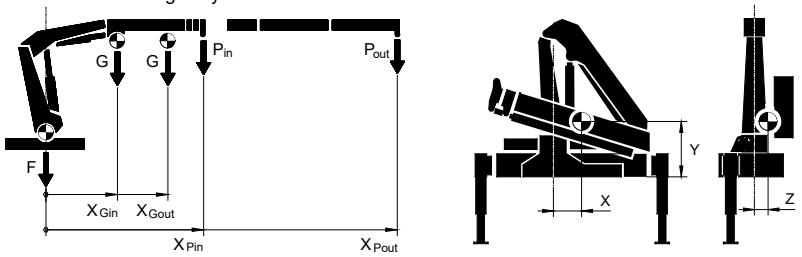


(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

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

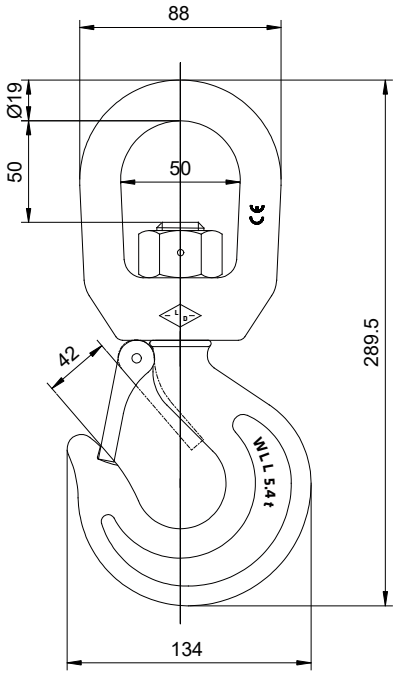
911NG	F kg	G kg	X_G in / out m	P in / out kg	X_P in / out m	TL kg	X	Y	Z
								mm	
1S	ST-M : 825 EX-M : 885 EX-H : 915 SE-H : 935	490	2.07 2.48	2450 1705	4.17 5.98	2131	199	656	15
2S		600	2.27 3.27	2370 1225	4.17 7.79	1531	194	683	7
3S		705	2.40 4.08	2220 880	4.25 9.82	1115	186	705	23
4S		800	2.50 4.89	2090 640	4.33 11.85	834	176	724	35
5S		890	2.59 5.69	1990 465	4.40 14.00	630	167	744	50

The data are relating to crane configuration with horizontal booms.

D.11 HOOK DATA

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

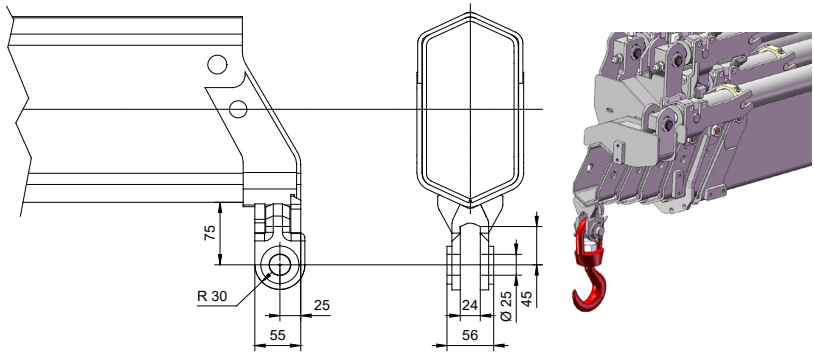
DIMENSIONS



TECHNICAL PROPERTIES
Working load limit (WLL) : 5400 kg
Material: alloy steel
Weight: 3.2 kg
Swivel hook
Reference standard: DIN 15401

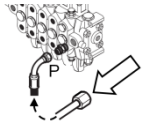
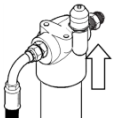
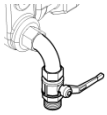
D.12 LOAD ATTACHMENT

ATTACHMENT FOR HOOK



D.13 HYDRAULIC SYSTEM

FITTINGS FOR CONNECTION TO PUMP

911NG	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

911NG	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.

911NG	Time interval min.	Max. load descent mm
1S	10	299
2S	10	389
3S	10	491
4S	10	592
5S	10	280

CAPACITY OF HYDRAULIC SYSTEM

911NG	Cylinders extended ℓ	Cylinders retracted ℓ
1S	38	27
2S	44	31
3S	51	36
4S	57	40
5S	63	45

Capacities do not include the oil tank.

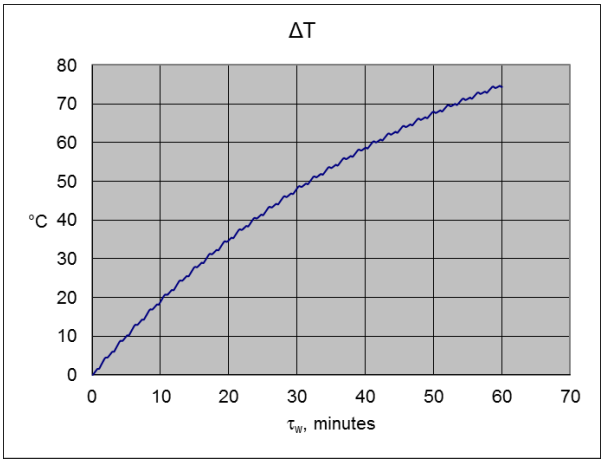
ADDITIONAL CAPACITY FOR HYDRAULICALLY OPERATED STABILIZER EXTENSIONS

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

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

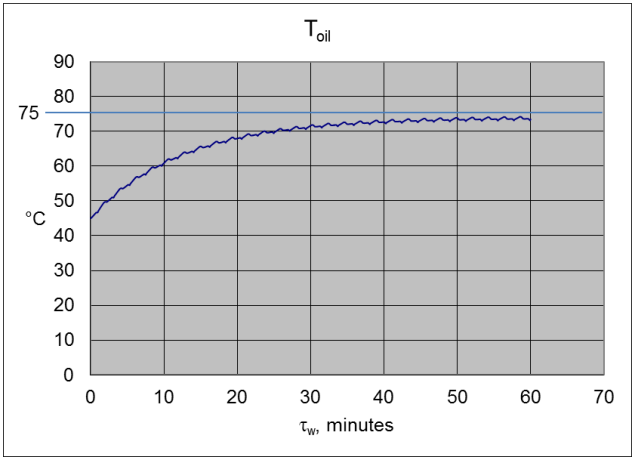
$$T_{env} + \tau_w > 57$$

where:
T_{env} : temperature of the environment (°C)
ΔT : difference in temperature between the oil and the environment (°C)
τ_w : working time (minutes)

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:

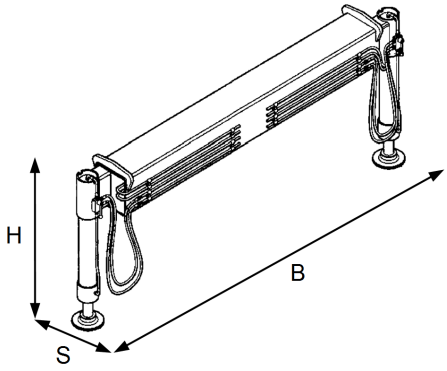
T_{env} (°C)	τ_w to exceed 75 °C (minutes)
45	no limit
48	35
50	25
52	20
54	15

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.)

D.15 ADDITIONAL STABILIZERS



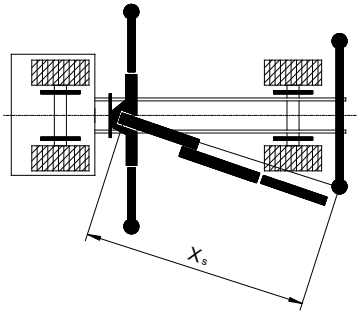
Additional stabilizers must be chosen so that:
- the installation is stable (see Installer Manual)
- the max. force acting on the additional stabilizers, F_s, is lower than the max. load allowed by the stabilizers itself, R_{max}.

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

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	2160x700x190
7850086	3.32	220	6250	2285x700x240
7850087	3.32	235	6250	2285x685x240

For further information see the User Manual for outriggers.

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	1705	H605-650	410	650	975	1295	81%	100%
2S	1225	H605-550	375	550	825	850	98%	100%
3S	880	H604-350	240	350	525	640	87%	100%
4S	640	H604-250	220	250	375	420	93%	100%
5S	465	H604-200	195	200	300	270	100%	90%

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/dm^3
(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

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	1705	H653-4 large	435	500	750	1270	70%	100%
2S	1225	H653-4 large	435	500	750	790	97%	100%
3S	880	H652-5 large	250	240	360	630	69%	100%
4S	640	H653-4 small	250	240	360	390	95%	100%
5S	465	H653-4 small	275	120	180	190	98%	100%

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/dm^3
(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

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	1705	H634-0,25	170	4000	1535	100%	38%
2S	1225	H634-0,25	170	4000	1055	100%	26%
3S	880	H634-0,25	170	4000	710	100%	18%
4S	640	H634-0,25	170	4000	470	100%	12%
5S	465	H634-0,25	170	4000	295	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: S1

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	1705	H332-850	245	2200	1460	100%	66%
2S	1225	H332-850	245	2200	980	100%	45%
3S	880	H332-850	245	2200	635	100%	29%
4S	640	H332-850	245	2200	395	100%	18%
5S	465	H332-850	245	2200	220	100%	10%

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

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	1705	H415 2000-500	155	2000	1550	100%	78%
2S	1225	H415 1500-500	135	1500	1090	100%	73%
3S	880	H415 1500-500	135	1500	745	100%	50%
4S	640	H415 1500-500	135	1500	505	100%	34%
5S	465	H415 1500-500	135	1500	330	100%	22%

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