D TECHNICAL SHEET

D.1 CRANE'S TECHNICAL DATA

Versions				2S	3S	4S
Max. net lifting moment			*t m* *kNm*	10.2 100.5	10.1 99.7	10.1 99.1
Max. dynamic moment			*daNm* *kNm*	12460 124.6		
Capacity at min. hydraulic outreach Max rated capacity	hook [S2]		*kg*	4745	4540	4375
	grab [S1]		*kg*	4745	4540	4375
	min outreach		*m*	2.16	2.24	2.31
Capacity at max. hydraulic outreach	hook [S2]		*kg*	1705	1205	900
	grab [S1]		*kg*	1705	1205	900
	max outreach		*m*	5.98	8.00	10.03
Capacity of 1st man. extension	capacity		*kg*	N/A	N/A	N/A
	max outreach		*m*	N/A	N/A	N/A
Max. load height above the base for the last extension	hydraulic		*m*	8.0	9.9	11.8
	manual		*m*	N/A	N/A	N/A
Weight of crane without stabilizers			*kg*	1060	1150	1230
Weight of stabilizers		ST-M	*kg*	160		
		EX-M	*kg*	220		
		EX-H	*kg*	250		
		SE-H	*kg*	270		
Weight of special attachment			*kg*	33	30	N/A
Max. working pressure			*bar*	305		
Max. oil flow rate			*ℓ/min*	20		
			ℓ/min	40		
Power needed			*kW*	13.2		
			kW	26.4		
Oil tank capacity			*ℓ*	75		
Gross slewing torque			*daNm* *kNm*	1730 17.3		
Slewing angle			°	425		
Max. base inclination			°	4°		
			°	3°		
Max boom inclination for use with CE winch			°	75°		
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 coversion factor, k			*kgm/bar*	40.37		
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		2S	3S	4S
Max line pull	*kg*	1000	1000	1000
Start angle - pull% Final angle - pull%		-	-	-

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	**2S**	**3S**	**4S**
ST-M	1220	1325	1410
EX-M	1280	1385	1470
EX-H	1310	1415	1500
SE-H	1330	1435	1520

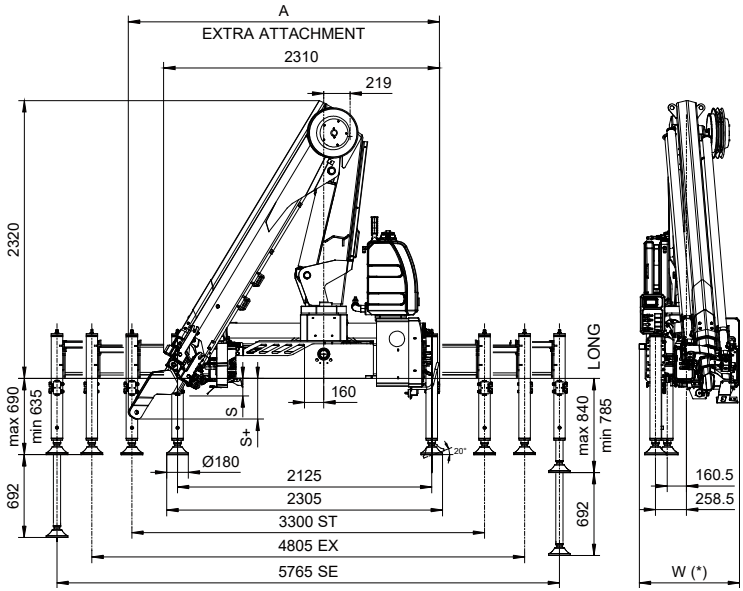
Additional weight for TI1 winch: 95 kg
Additional weight of 1st extra function activated with hose reel: 20 kg
Additional weight of 2nd extra function activated with hose reel: 10 kg
The weights may vary by ± 3%

In case of special attachment the total weights are the following:

kg	Crane version		
Type of stabilizers	**2S**	**3S**	**4S**
ST-M	1255	1355	N/A
EX-M	1315	1415	N/A
EX-H	1345	1445	N/A
SE-H	1365	1465	N/A

D.4 OVERALL DIMENSIONS

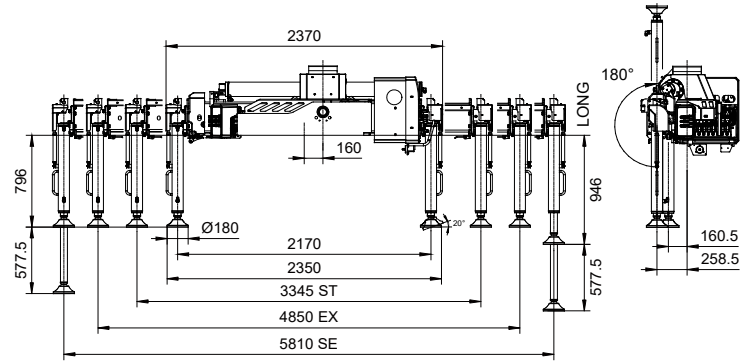
FIXED STABILIZERS LEGS



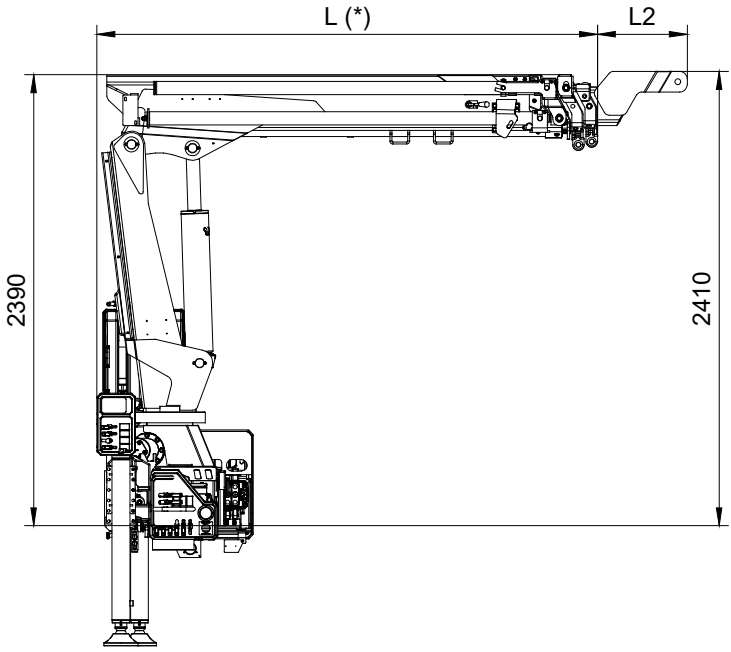
	2S	3S	4S
A (mm)	2560	2600	N/A
S (mm)	35	90	150
S+ (mm)	265	340	N/A
W (*) (mm)	830	830	830

(*) The width has to be decreased by 10 mm in case of ST stabilisers.

TURNING STABILIZERS LEGS



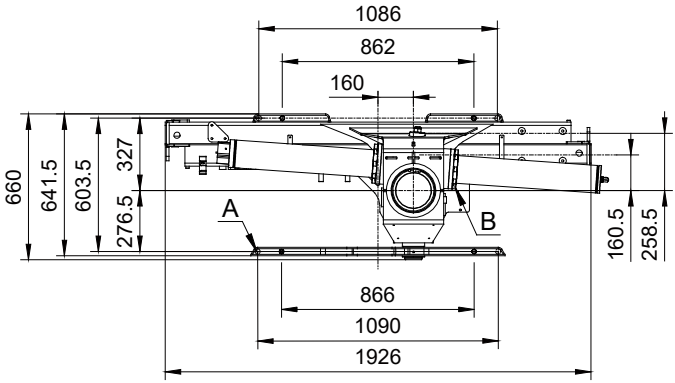
OVERALL DIMENSIONS



	2S	3S	4S
L (*) (mm)	2590	2660	2750
L2 (mm)	465	480	N/A

(*) The width has to be decreased by 10 mm in case of ST stabilisers.

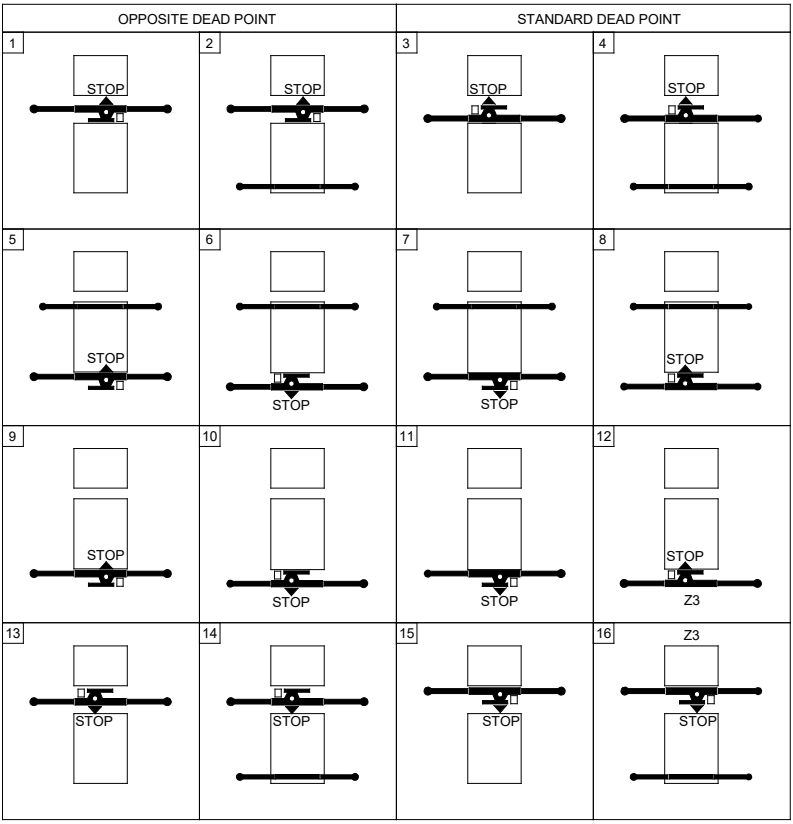
D.5 BASE DIMENSIONS AND MOUNTING BOLTS



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

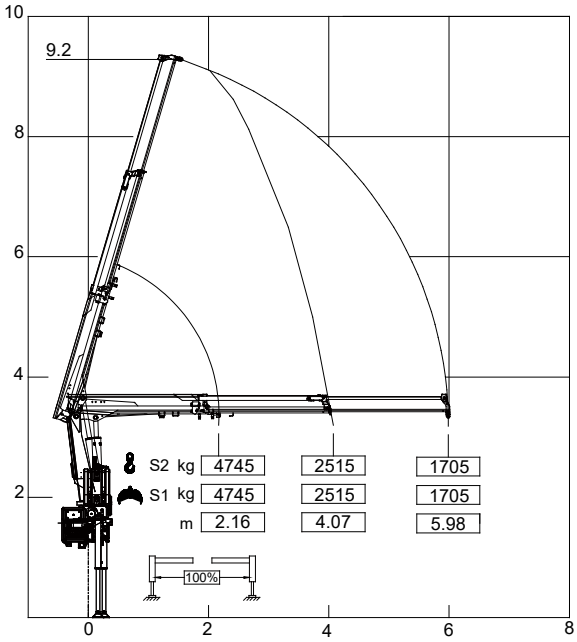
Installation types numbers (ITN) for cranes with standard dead point (STOP) toward swing bridge.



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

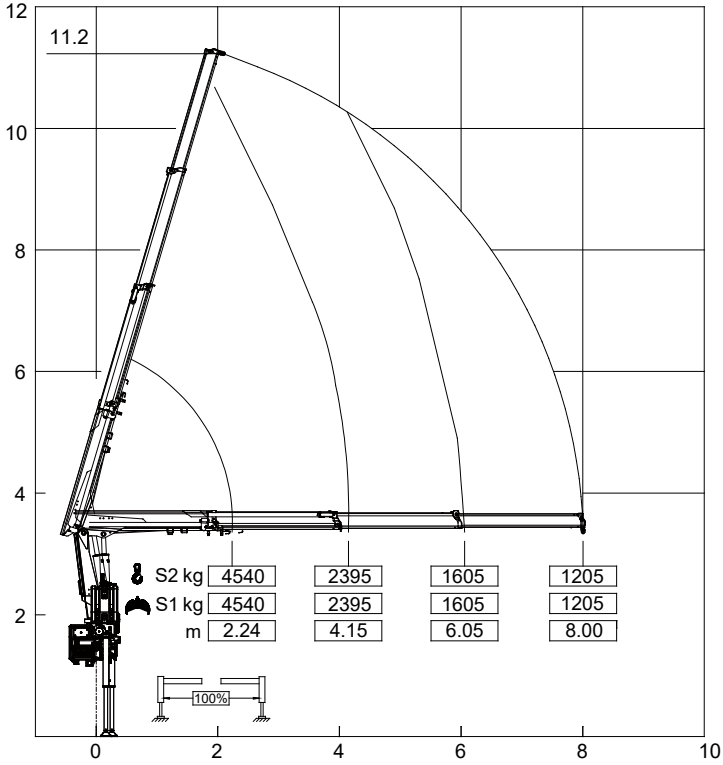
D.7 LOAD CHARTS FOR USE WITH HOOK/TOOL

811NG T 2S



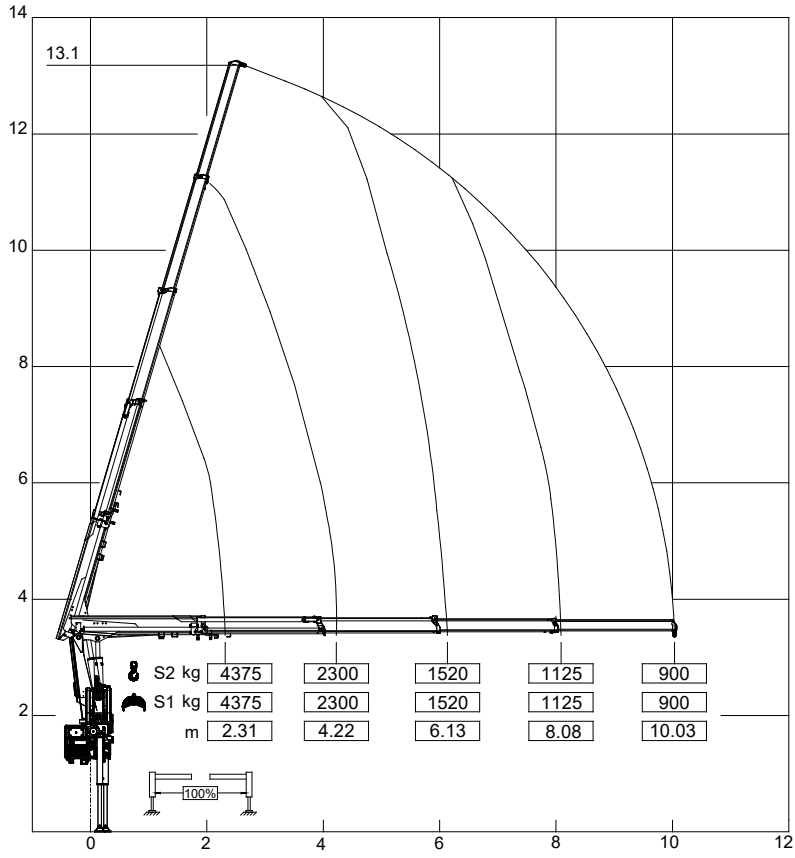
If an additional lifting tool is mounted, the rated capacities are reduced by the tool's weight.

LOAD CHARTS FOR USE WITH HOOK/TOOL
811NG T 3S



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

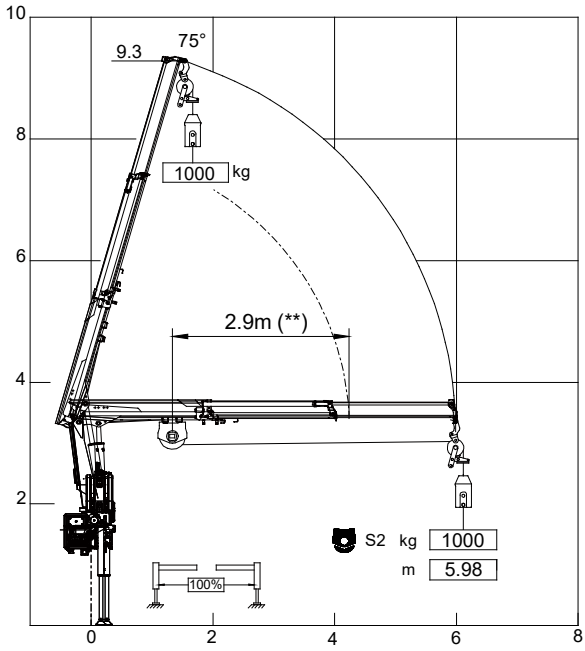
LOAD CHARTS FOR USE WITH HOOK/TOOL
811NG T 4S



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

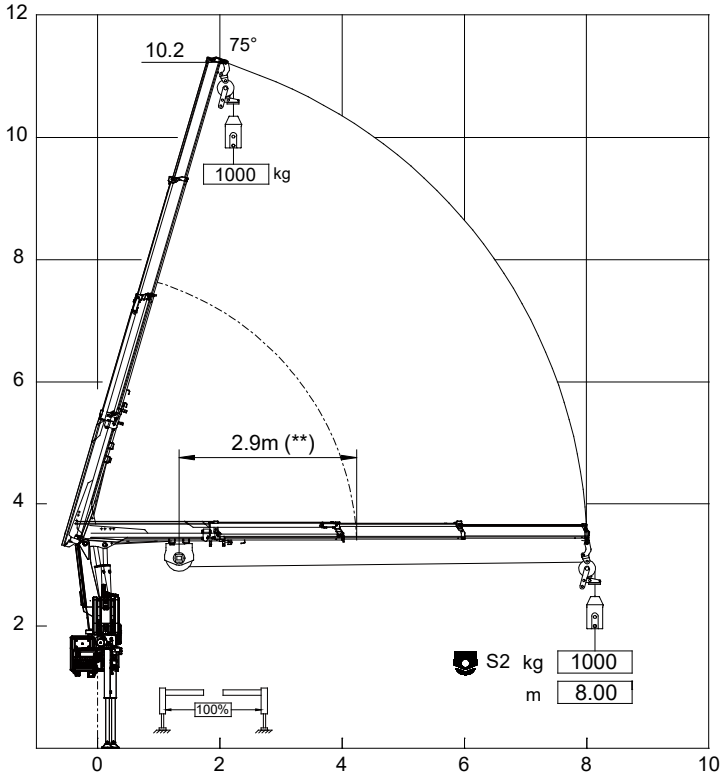
D.8 LOAD CHARTS FOR TI1 WINCH IN SINGLE LINE

811NG T 2S + TI1 SINGLE LINE



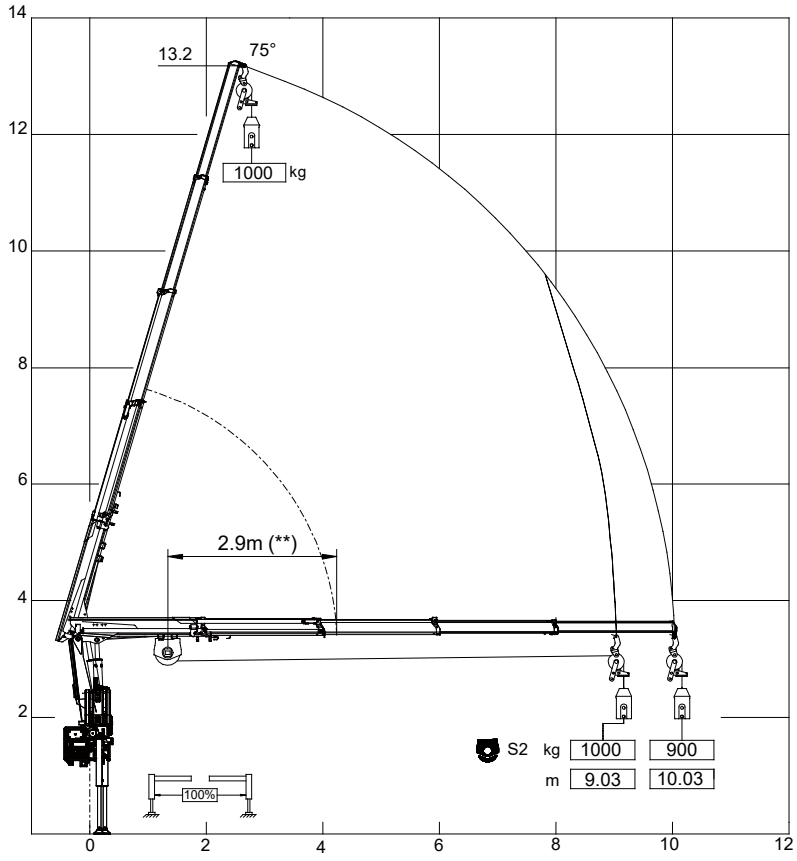
(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

LOAD CHART FOR WINCH TI1 IN SINGLE LINE
811NG T 3S + TI1 SINGLE LINE



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

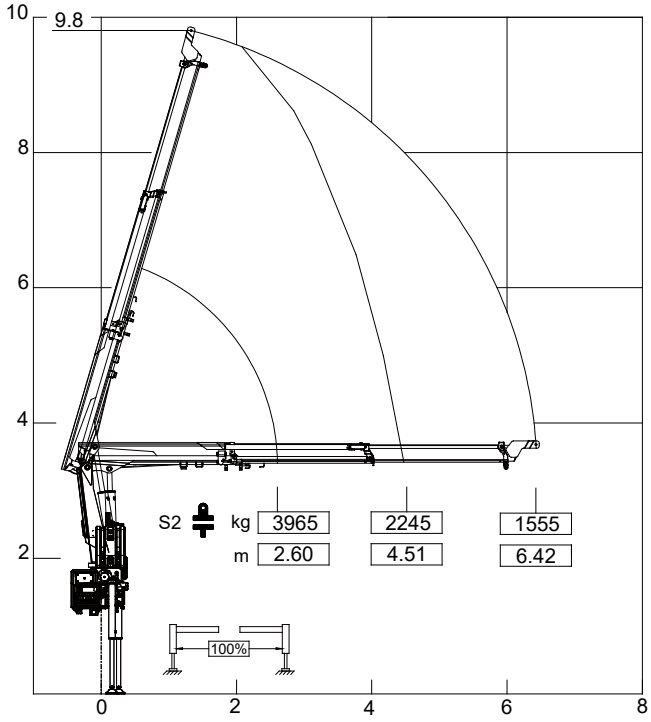
LOAD CHART FOR WINCH TI1 IN SINGLE LINE
811NG T 4S + TI1 SINGLE LINE



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

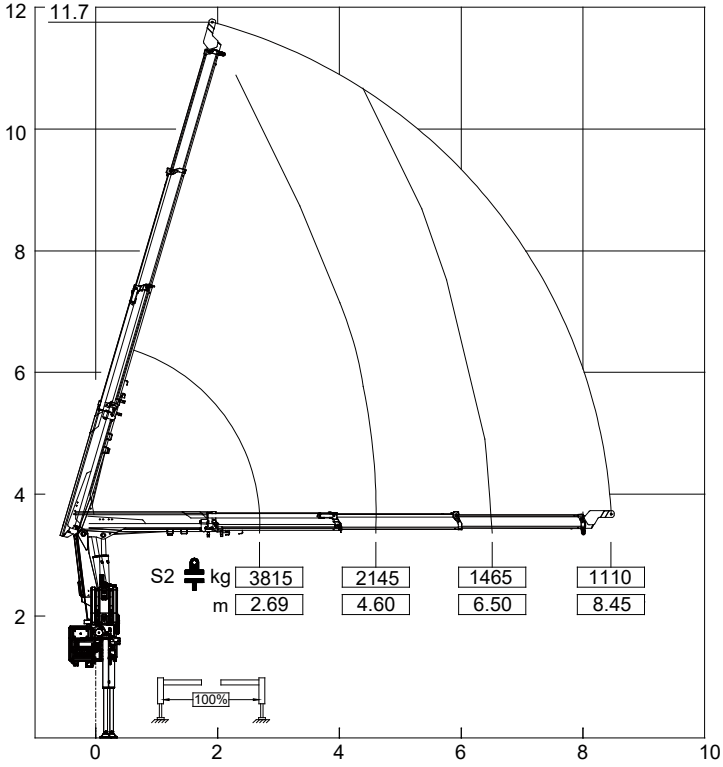
D.9 LOAD CHARTS FOR USE WITH SPECIAL ATTACHMENT

811NG T 2S



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

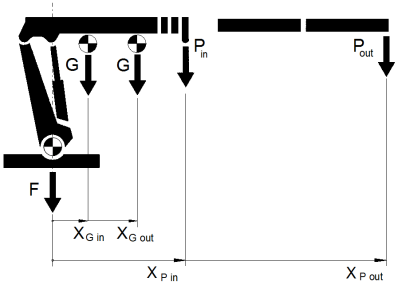
LOAD CHARTS FOR USE WITH SPECIAL HOOK
811NG T 3S

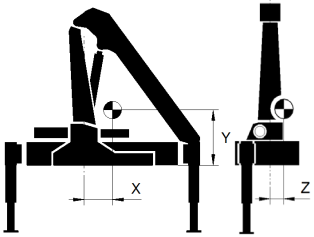


If an additional lifting tool is mounted, the rated capacities are reduced by the tool's weight.

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: STANDARD CRANE

811NG T	F kg	G kg	X_G in / out m	P in / out kg	X_P in / out m	TL kg	X	Y	Z
								mm	
2S	ST-M : 740 EX-M : 800 EX-H : 830 SE-H : 850	480	0.93 2.57	4745 1705	2.16 5.98	**2131**	200	624	-32
3S		585	0.95 3.33	4540 1205	2.24 8.00	**1506**	233	648	-19
4S		670	0.97 4.02	4375 900	2.31 10.03	**1134**	256	660	-10

WEIGHTS AND COG: CRANE WITH SPECIAL ATTACHMENT

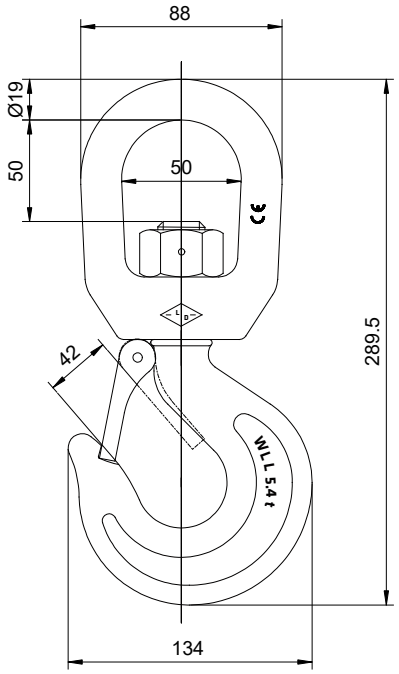
811NG T	F kg	G kg	X_G in / out m	P in / out kg	X_P in / out m	TL kg	X	Y	Z
								mm	
2S	ST-M : 740 EX-M : 800	515	0.83 2.88	3965 1555	2.60 6.42	**1944**	225	612	-27
3S	EX-H : 830 SE-H : 850	615	0.96 3.53	3815 1110	2.69 8.45	**1388**	257	634	-15

The data are relating to crane configuration with horizontal booms.

D.11 HOOK DATA

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

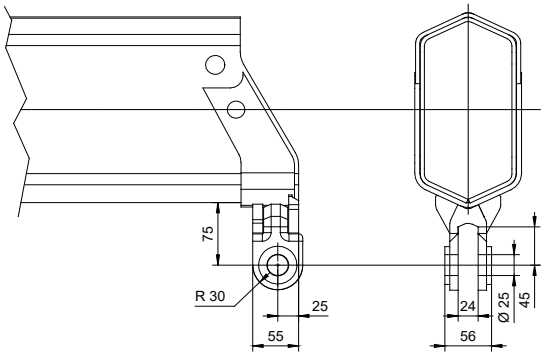
DIMENSIONS

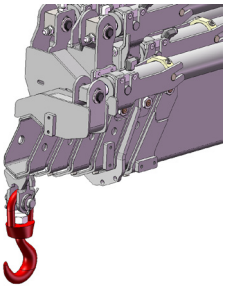


TECHNICAL PROPERTIES
Working load limit (WLL) : 5400 kg
Material: alloy steel
Weight: 3.2 kg
Swivel hook
Reference standard: DIN 15401

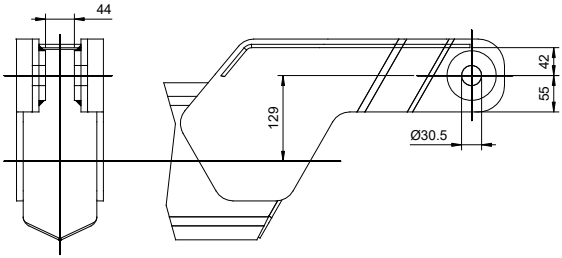
D.12 LOAD ATTACHMENT

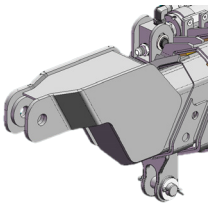
ATTACHMENT FOR HOOK





SPECIAL ATTACHMENT FOR ROADSIDE ASSISTANCE EQUIPMENT

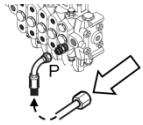
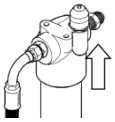
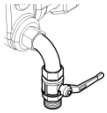




7800069 for 2S
7800070 for 3S

D.13 HYDRAULIC SYSTEM

FITTINGS FOR CONNECTION TO PUMP

811NG T	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

811NG T	Extension time s	Retraction time s
Slewing (180°)	20	20
1.boom cylinder	N/A	N/A
boom extension 1S	N/A	N/A
boom extension 2S	N/A	N/A
boom extension 3S	N/A	N/A
boom extension 4S	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.

811NG T	Time interval min.	Max. load descent mm
2S	10	299
3S	10	400
4S	10	501

CAPACITY OF HYDRAULIC SYSTEM

811NG T	Cylinders extended ℓ	Cylinders retracted ℓ
2S	28	19
3S	32	23
4S	37	25

Capacities do not include the oil tank.

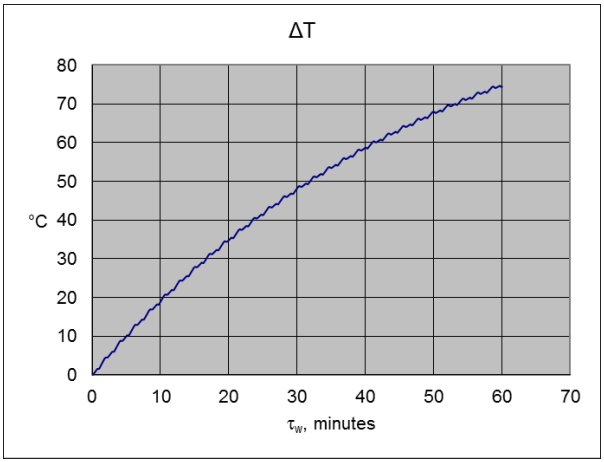
ADDITIONAL CAPACITY FOR HYDRAULICALLY OPERATED STABILIZER EXTENSIONS

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

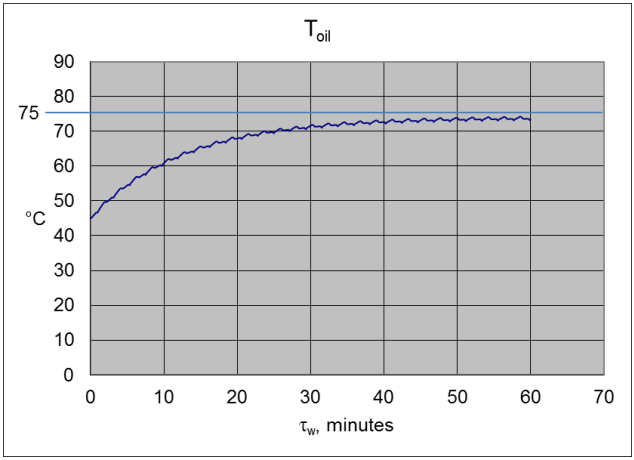
$$T_{env} + \tau_w > 57$$

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:

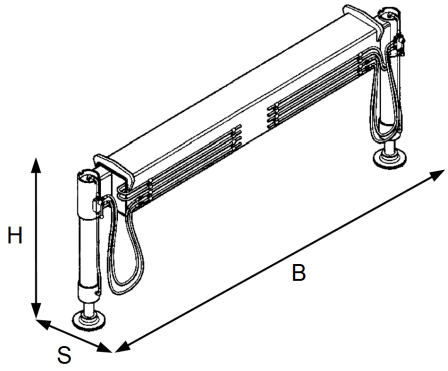
T_{env} (°C)	τ_w to exceed 75 °C (minutes)
45	no limit
48	35
50	25
52	20
54	15

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



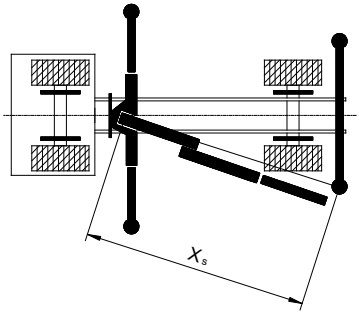
Additional stabilizers must be chosen so that:
- the installation is stable (see Installer Manual)
- the max. force acting on the additional stabilizers, F_s, is lower than the max. load allowed by the stabilizers itself, R_{max}.

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

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)
2S	1705	H605-650	410	650	975	1295	81%	100%
3S	1205	H605-550	375	550	825	830	100%	100%
4S	900	H604-350	240	350	525	660	85%	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 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)
2S	1705	H653-4 large	435	500	750	1270	70%	100%
3S	1205	H653-4 large	435	500	750	770	98%	100%
4S	900	H653-4 small	250	240	360	650	68%	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]
2S	1705	H634-0,25	170	4000	1535	100%	38%
3S	1205	H634-0,25	170	4000	1035	100%	26%
4S	900	H634-0,25	170	4000	730	100%	18%

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)
2S	1705	H332-850	245	2200	1460	100%	66%
3S	1205	H332-850	245	2200	960	100%	44%
4S	900	H332-850	245	2200	655	100%	30%

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)
2S	1705	H415 2000-500	155	2000	1550	100%	78%
3S	1205	H415 1500-500	135	1500	1070	100%	71%
4S	900	H415 1500-500	135	1500	765	100%	51%

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