D TECHNICAL SHEET

D.1 CRANE'S TECHNICAL DATA

Versions			2S	3S	4S
Max. net lifting moment		*t m* *kNm*	13.1 128.7	12.9 127.2	12.8 125.6
Max. dynamic moment		*daNm* *kNm*	15260 153		
Capacity at min. hydraulic outreach Max rated capacity	hook [S2]	*kg*	5085	4875	4675
	grab [S1]	*kg*	5085	4875	4675
	min outreach	*m*	2.58	2.66	2.74
Capacity at max. hydraulic outreach	hook [S2]	*kg*	2060	1460	1080
	grab [S1]	*kg*	2060	1460	1080
	max outreach	*m*	6.18	8.24	10.30
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*	8.4	10.4	12.4
	manual	*m*	N/A	N/A	N/A
Weight of crane without stabilizers		*kg*	1285	1385	1480
Weight of stabilizers	ST-M	*kg*	210		
	EX-M	*kg*	270		
	EX-H	*kg*	305		
	SE-H	*kg*	360		
Weight of special attachment		*kg*	40	37	34
Max. working pressure		*bar*	285		
Max. oil flow rate		*ℓ/min*	30		
		ℓ/min	60		
Power needed		*kW*	18.5		
		kW	37.1		
Oil tank capacity		*ℓ*	130		
Gross slewing torque		*daNm* *kNm*	1420 14.2		
Slewing angle		°	425		
Max. working heel		°	4°		
		°	3°		
Max boom inclination for use with CE winch		°	75°		
Max. stabilizer force on the ground with stabilizers fully extended		*daN*	7870		
		daN	6010		
		daN	4860		
Max. stabilizer pressure on the ground with stabilizers fully extended		*MPa*	3.1		
		MPa	2.4		
		MPa	1.9		
Lifting coversion factor, k		*kgm/bar*	52.53		
Distribution factor of dyn. moment on base, β		-	0.70		
Position of standard dead point (see D.6)		▲			

D.2 WINCHES' TECHNICAL DATA

TC1 - SINGLE LINE PULL

Versions			2S	3S	4S
	Max line pull	*kg*	1000	1000	1000

TC1 - DOUBLE LINE PULL

Versions			2S	3S	4S
	Max line pull	*kg*	1000	1000	1000

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	1495	1595	1690
EX-M	1555	1655	1750
EX-H	1590	1690	1785
SE-H	1645	1745	1840

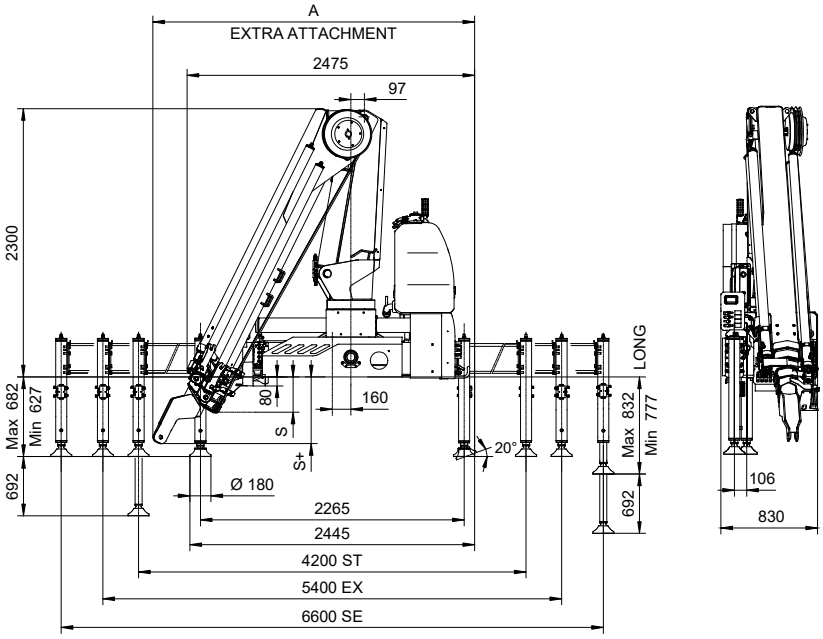
Additional weight for TC1 winch: 95 kg
Additional weight of 1st extra function activated with hose reel: 20 kg
Additional weight of 2nd extra function activated with hose reel: 10 kg
The weights may vary by ±3%

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

kg	Crane version		
Type of stabilizers	**2S**	**3S**	**4S**
ST-M	1550	1650	1740
EX-M	1610	1710	1800
EX-H	1645	1745	1835
SE-H	1700	1800	1890

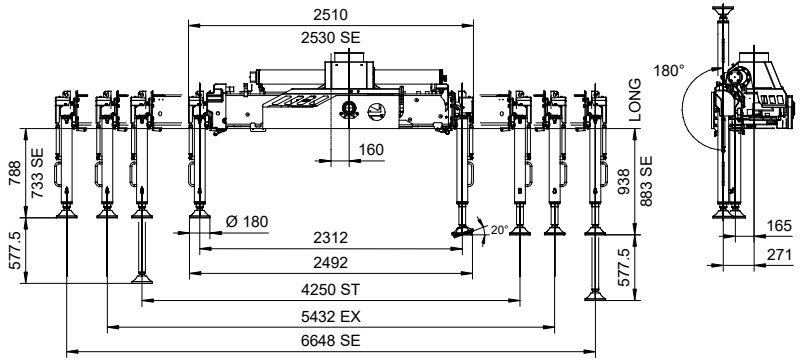
D.4 OVERALL DIMENSIONS

FIXED STABILIZERS LEGS

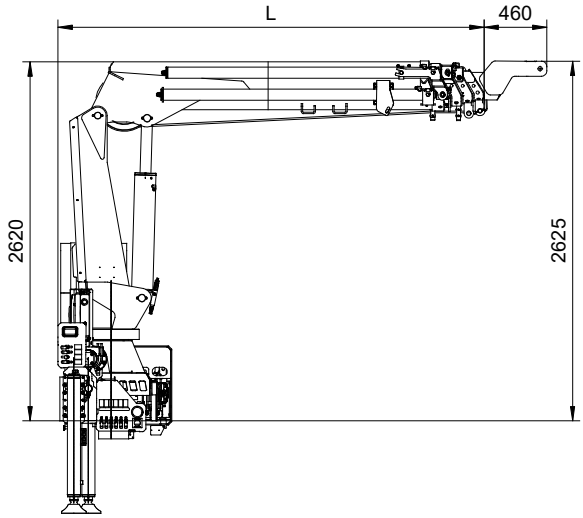


	2S	3S	4S
A (mm)	2680	2725	2765
S (mm)	160	230	300
S+ (mm)	430	500	570

TURNING STABILIZERS LEGS

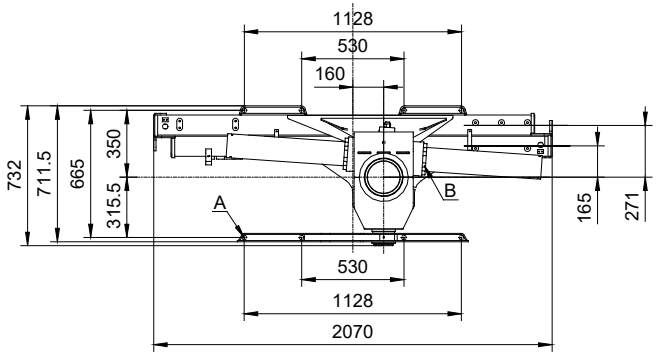


OVERALL DIMENSIONS



Version	L mm
2S	2940
3S	3020
4S	3100

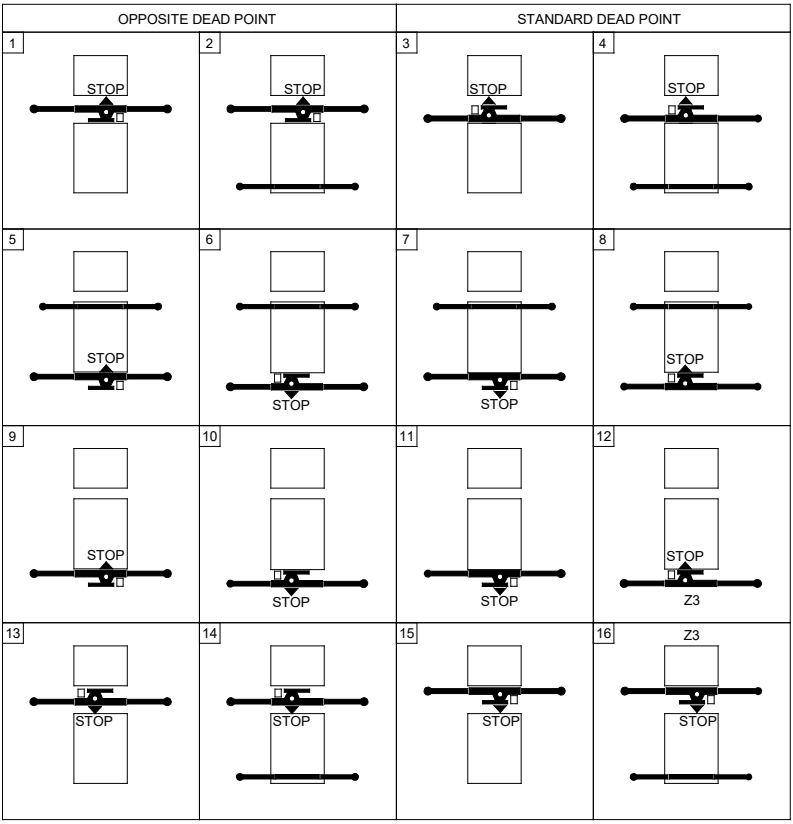
D.5 BASE DIMENSIONS AND MOUNTING BOLTS



Ref.	Description	Q.ty	Material Grade	Size	Tightening torque
A	Kit with 8 crane mounting bolts	8	42CrMo4+QT EN 10083-3	M24x2 L=1100	400 Nm
	Kit with 4 crane mounting bolts	4	42CrMo4+QT EN 10083-3	M30x2 L=600	700 Nm
B	Fixing bolts for each slewing cylinder	10	8.8	M14x2 L=40	80 Nm

D.6 INSTALLATION TYPE NUMBER

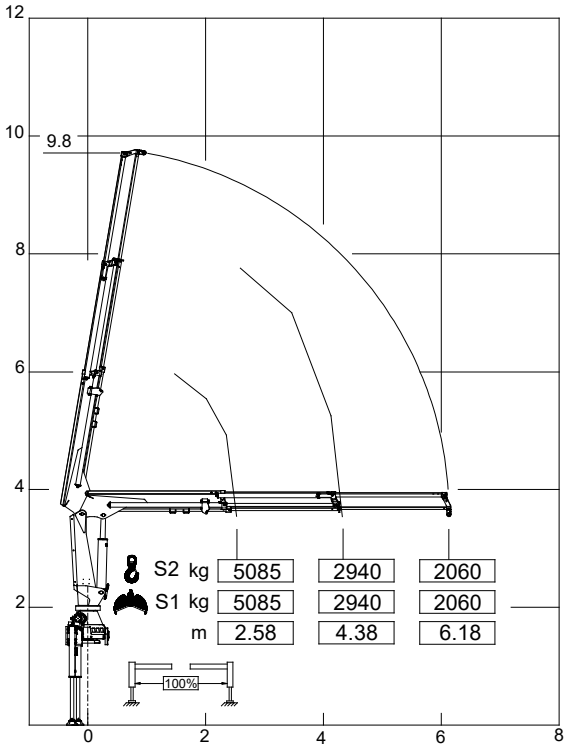
Installation types numbers (ITN) for cranes with standard dead point (STOP) toward swing bridge.



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

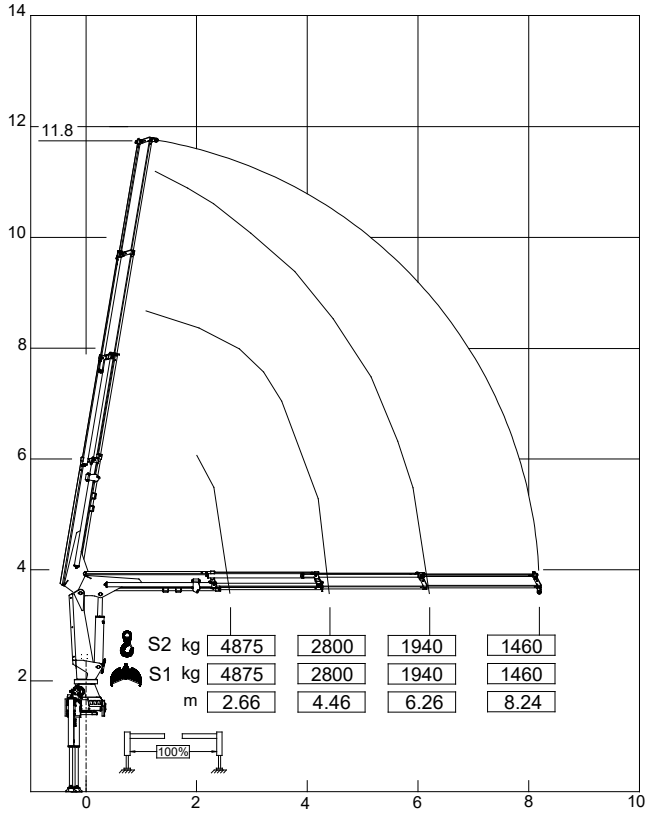
D.7 LOAD CHARTS FOR USE WITH HOOK/TOOL

814NG T 2S



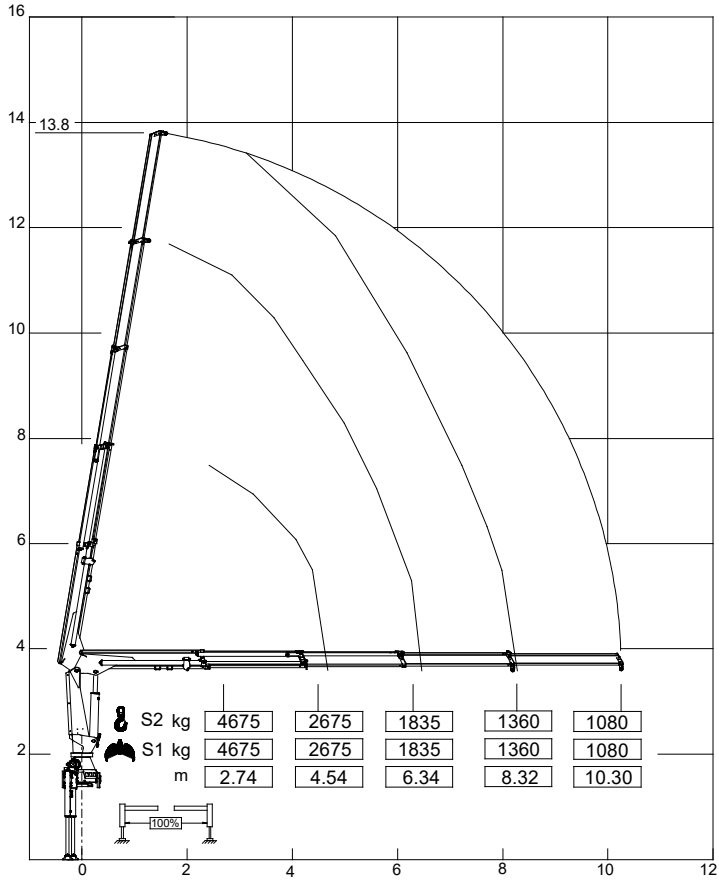
If an additional lifting tool is mounted, the rated capacities are reduced by the tool's weight.

LOAD CHARTS FOR USE WITH HOOK/TOOL
814NG T 3S



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

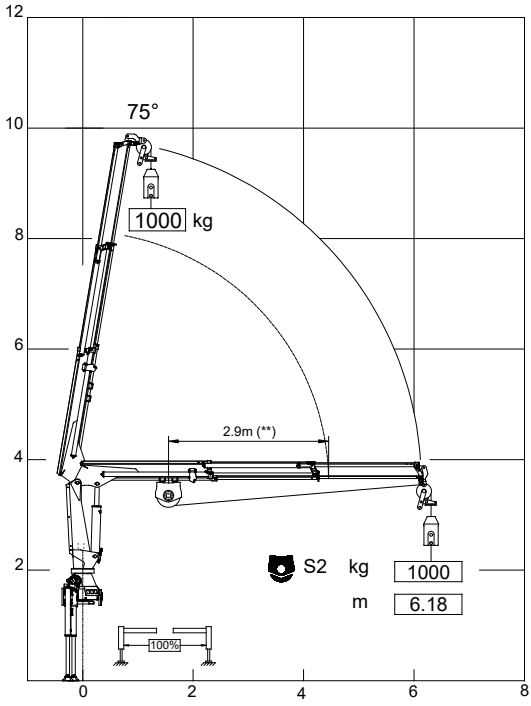
LOAD CHARTS FOR USE WITH HOOK/TOOL
814NG T 4S



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

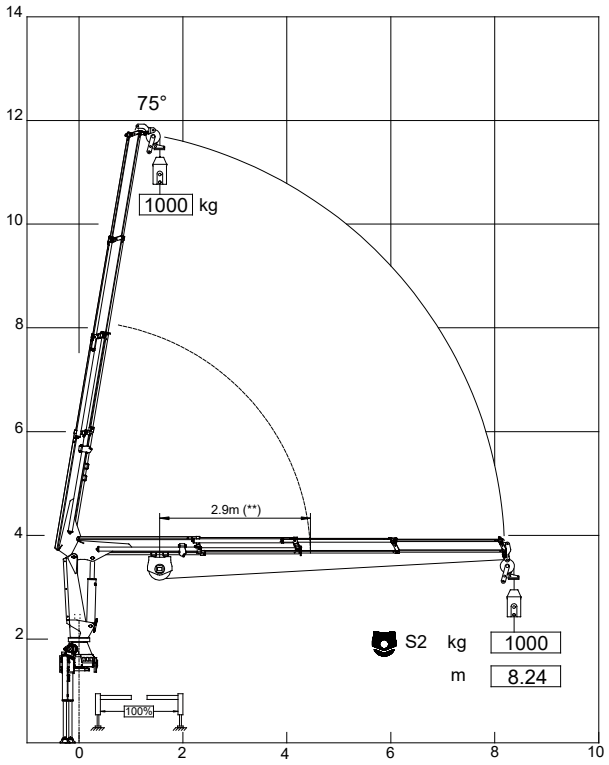
D.8 LOAD CHARTS FOR TC1 WINCH IN SINGLE LINE

814NG T 2S + TC1 SINGLE LINE



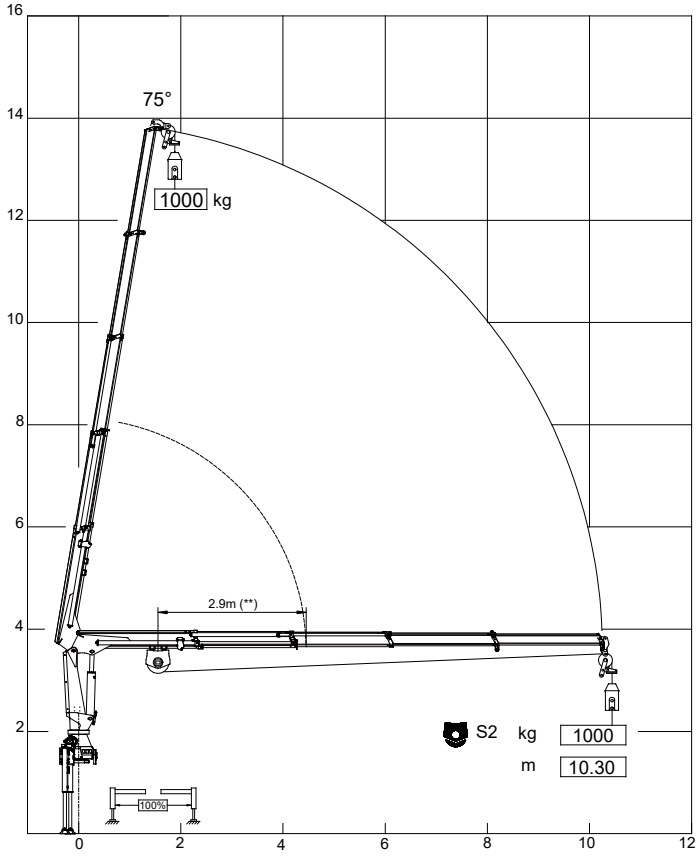
(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

LOAD CHART FOR WINCH TC1 IN SINGLE LINE
814NG T 3S + TC1 SINGLE LINE



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

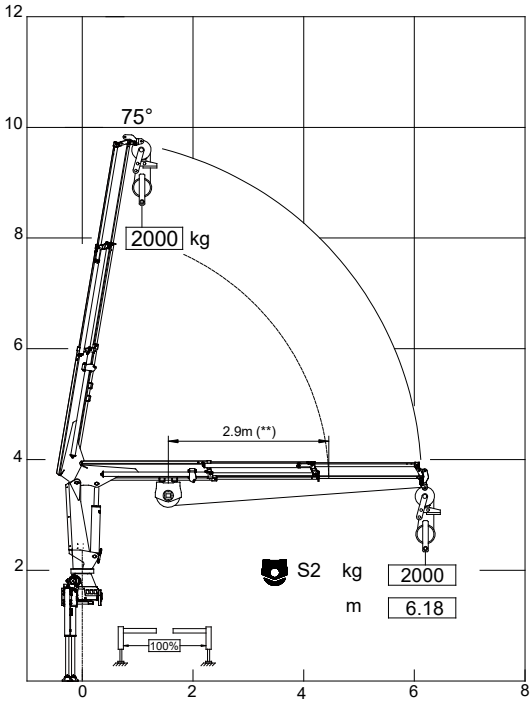
LOAD CHART FOR WINCH TC1 IN SINGLE LINE
814NG T 4S + TC1 SINGLE LINE



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

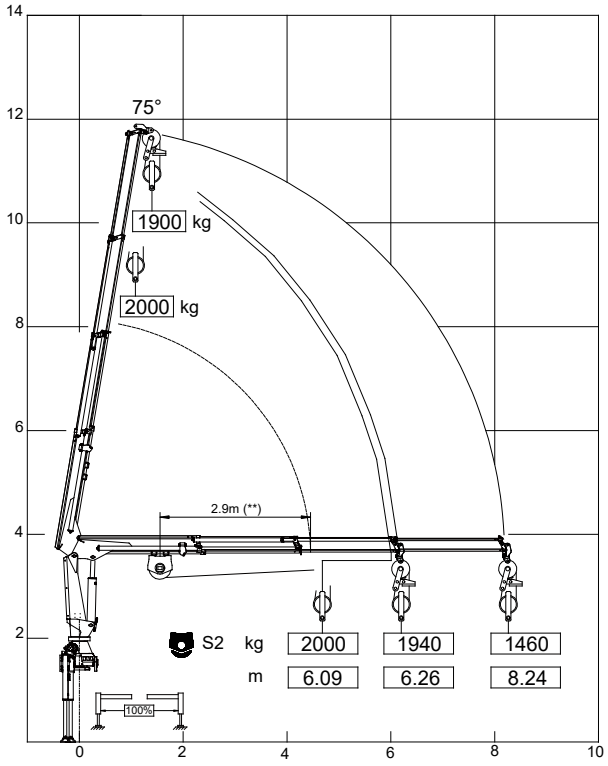
D.9 LOAD CHARTS FOR TC1 WINCH IN DOUBLE LINE

814NG T 2S + TC1 DOUBLE LINE



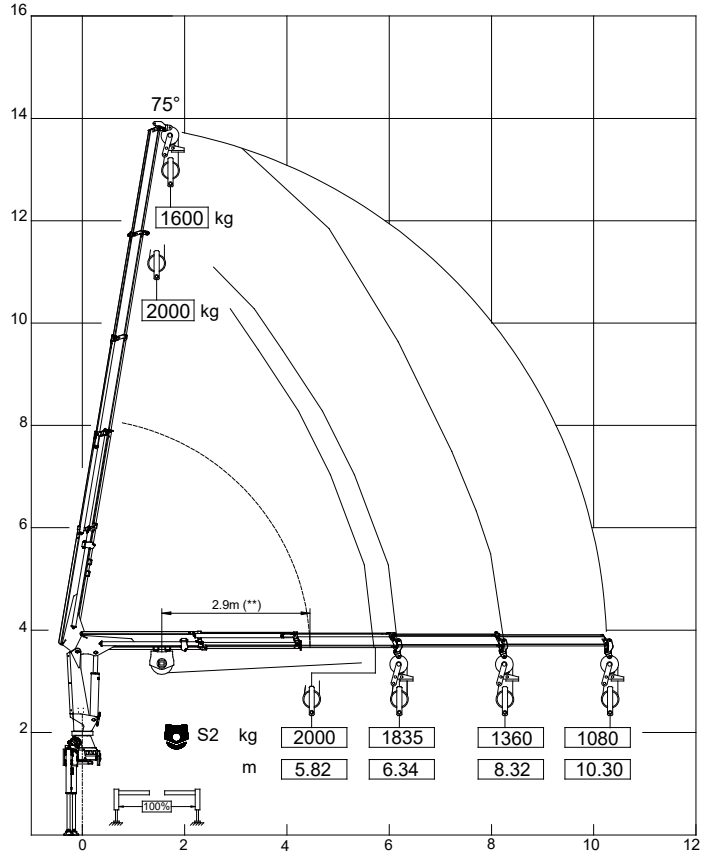
(**) Minimum distance winch - pulley
Winch max. pull: 1000 kg

LOAD CHART FOR WINCH TC1 IN DOUBLE LINE
814NG T 3S + TC1 DOUBLE LINE



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

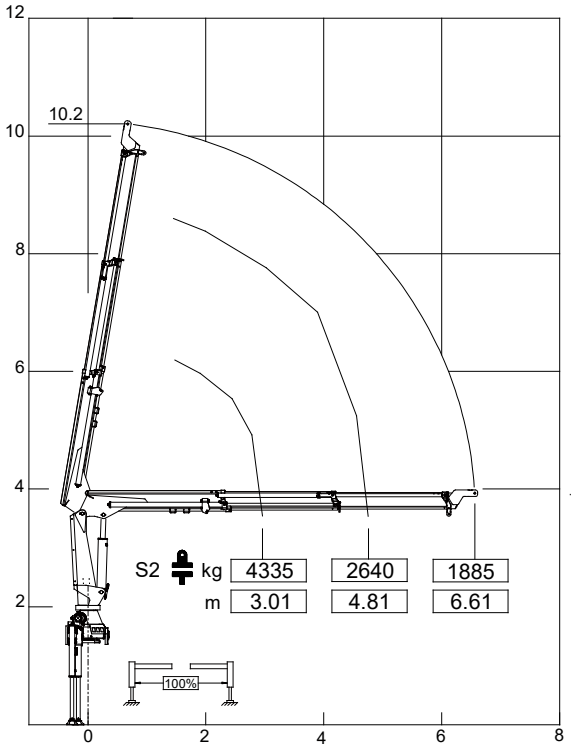
LOAD CHART FOR WINCH TC1 IN DOUBLE LINE
814NG T 4S + TC1 DOUBLE LINE



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

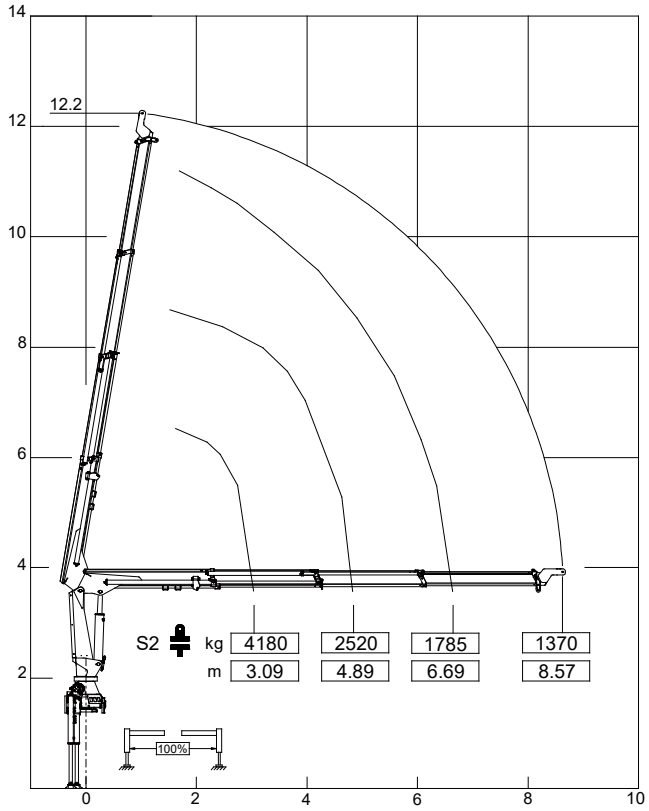
D.10 LOAD CHARTS FOR USE WITH SPECIAL ATTACHMENT

814NG T 2S



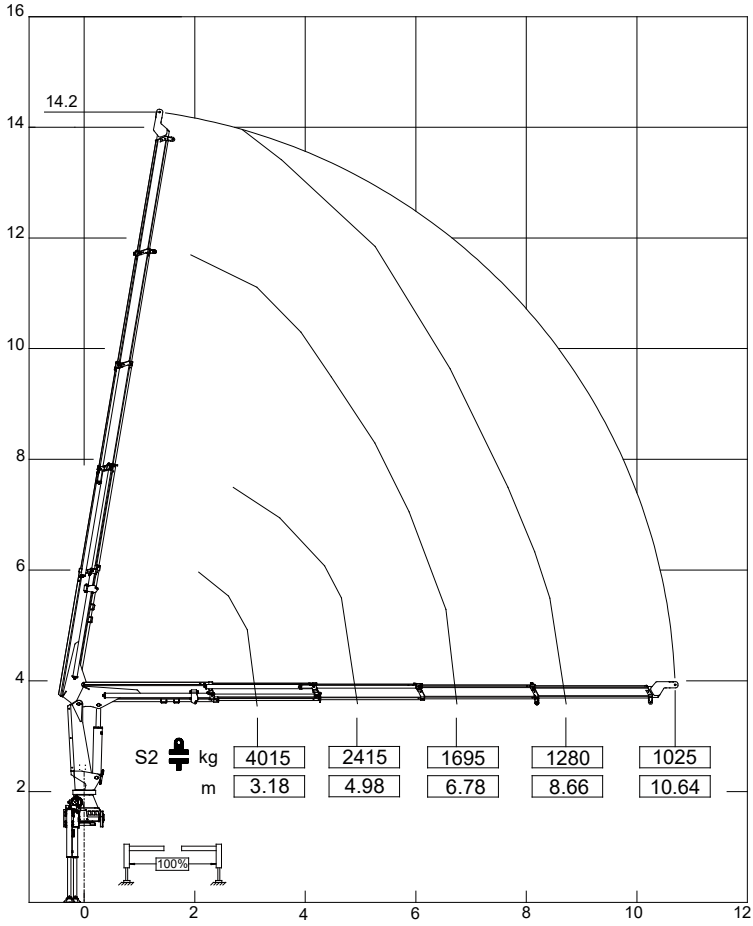
If an additional lifting tool is mounted, the rated capacities are reduced by the tool's weight.

LOAD CHARTS FOR USE WITH SPECIAL HOOK
814NG T 3S



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

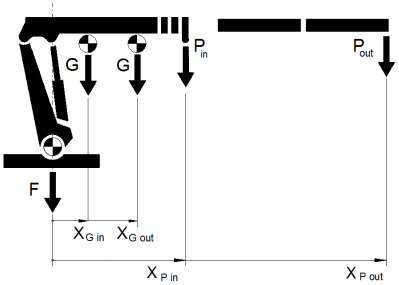
LOAD CHARTS FOR USE WITH SPECIAL HOOK
814NG T 4S

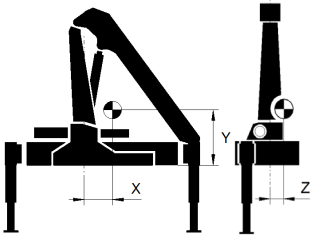


If an additional lifting tool is mounted, the rated capacities are reduced by the tool's weight.

D.11 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

814NG 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 : 1050 EX-M : 1110 EX-H : 1145 SE-H : 1200	445	1.36 2.81	5085 2060	2.58 6.18	2575	242	707	-32
3S		545	1.40 3.52	4875 1460	2.66 8.24	1825	283	717	-17
4S		640	1.43 4.26	4675 1080	2.74 10.30	1350	312	722	-5

WEIGHTS AND COG: CRANE WITH SPECIAL ATTACHMENT

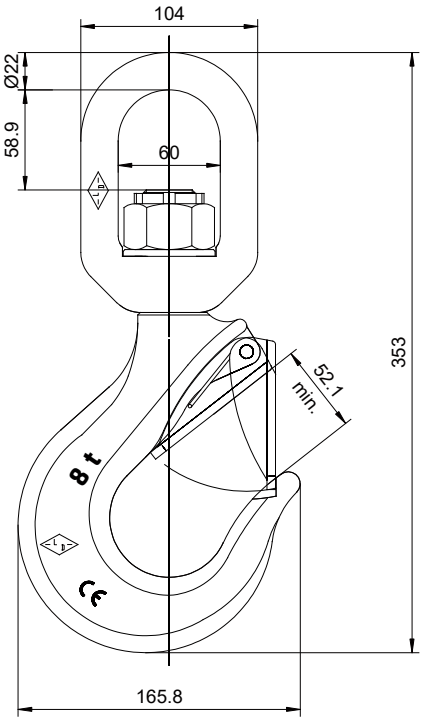
814NG T	F kg	G kg	X_G in / out m	P in / out kg	X_P in / out m	TL kg	X	Y	Z
								mm	
2S	ST-M : 1050 EX-M : 1110 EX-H : 1145 SE-H : 1200	500	1.47 3.09	4335 1885	3.01 6.61	2356	280	600	-31
3S		600	1.48 3.82	4180 1370	3.09 8.57	1713	321	610	-16
4S		690	1.50 4.57	4015 1025	3.18 10.64	1289	350	615	-4

The data are relating to crane configuration with horizontal booms.

D.12 HOOK DATA

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

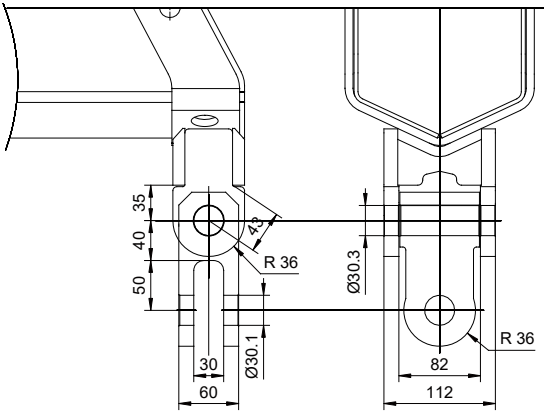
DIMENSIONS

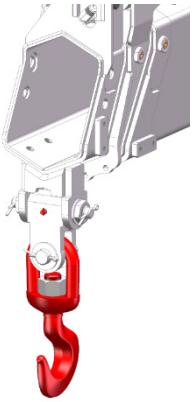


TECHNICAL PROPERTIES
Working load limit (WLL) : 8000 kg
Material: alloy steel
Weight: 6.2 kg
Swivel hook
Reference standard: DIN 15401

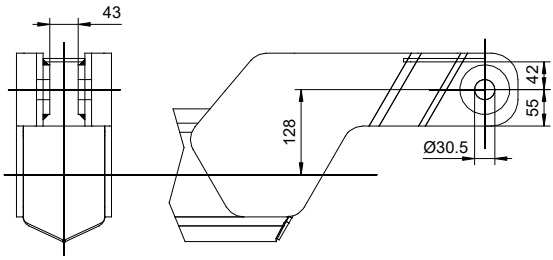
D.13 LOAD ATTACHMENT

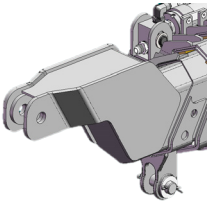
ATTACHMENT FOR HOOK AND LIFTING TOOL





SPECIAL ATTACHMENT FOR ROADSIDE ASSISTANCE EQUIPMENT

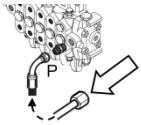
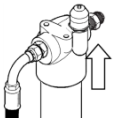
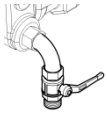




7800437 for 2S
7800438 for 3S
7800439 for 4S

D.14 HYDRAULIC SYSTEM

FITTINGS FOR CONNECTION TO PUMP

814NG 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

814NG T	Extension time s	Retraction time s
Slewing (180°)	20	20
2.boom cylinder	17	29
boom extension 1S	13	8
boom extension 2S	26	16
boom extension 3S	39	23
boom extension 4S	53	30

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

CAPACITY OF HYDRAULIC SYSTEM

814NG T	Cylinders extended ℓ	Cylinders retracted ℓ
2S	45	31
3S	52	36
4S	60	41

Capacities do not include the oil tank.

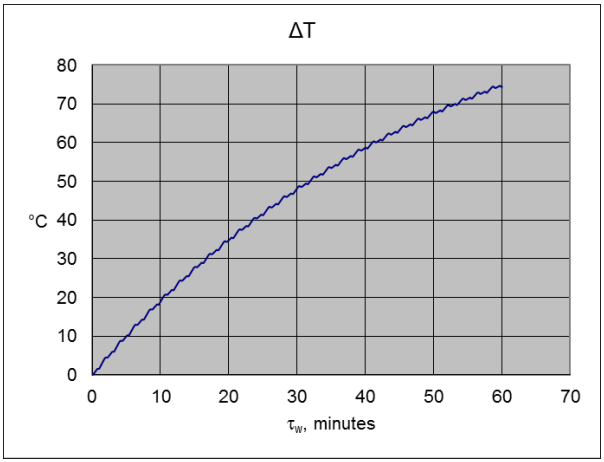
ADDITIONAL CAPACITY FOR HYDRAULICALLY OPERATED STABILIZER EXTENSIONS

EX-H	+4.0	+2.5
SE-H	+5.5	+3.5

D.15 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

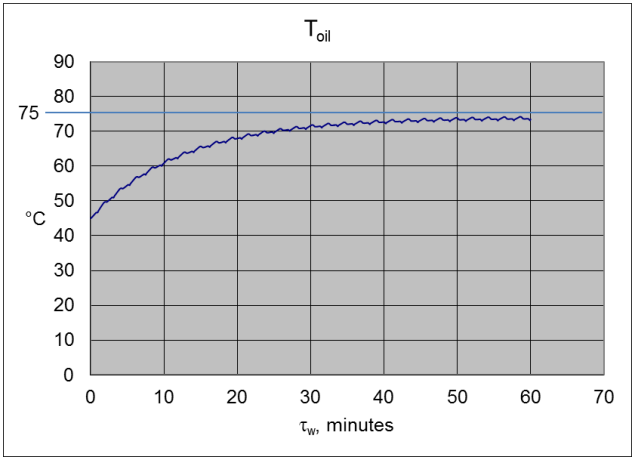
$$T_{env} + \tau_w > 57$$

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:

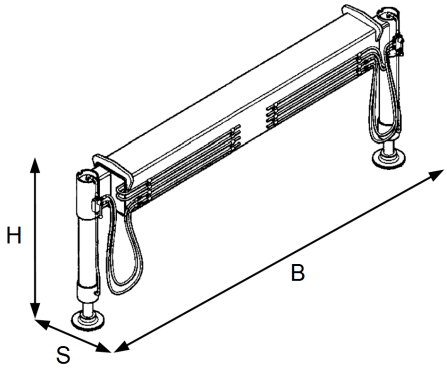
T_{env} (°C)	τ_w to exceed 75 °C (minutes)
45	no limit
48	35
50	25
52	20
54	15

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.16 ADDITIONAL STABILIZERS



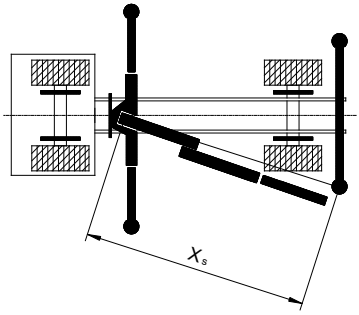
Additional stabilizers must be chosen so that:
- the installation is stable (see Installer Manual)
- the max. force acting on the additional stabilizers, F_s, is lower than the max. load allowed by the stabilizers itself, R_{max}.

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

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.

D.17 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	2060	H605-650	410	650	975	**1670**	67%	100%
3S	1460	H605-650	410	650	975	**1060**	95%	100%
		H605-550	375	550	825	**1095**	82%	100%
4S	1080	H605-450	340	450	675	**740**	94%	100%
		H604-350	240	350	525	**840**	71%	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	2060	H653-4 large	435	500	750	**1625**	58%	100%
3S	1460	H653-4 large	435	500	750	**1025**	81%	100%
4S	1080	H653-4 large	395	350	525	**685**	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 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	2060	H634-0,25	170	4000	**1890**	100%	47%
3S	1460	H634-0,25	170	4000	**1290**	100%	32%
4S	1080	H634-0,25	170	4000	**910**	100%	23%

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	2060	H332-850	245	2200	**1815**	100%	83%
3S	1460	H332-850	245	2200	**1215**	100%	55%
4S	1080	H332-850	245	2200	**835**	100%	38%

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	2060	H415 1500-500	135	1500	**1925**	79%	100%
3S	1460	H415 1500-500	135	1500	**1325**	100%	88%
4S	1080	H415 1500-500	135	1500	**945**	100%	63%

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