D TECHNICAL SHEET

D.1 CRANE'S TECHNICAL DATA

Versions				2S	3S	4S
Max. net lifting moment			*t m* *kNm*	22.7 223	21.9 215	21.1 207
Max. dynamic moment			*daNm* *kNm*	27570 275		
Capacity at min. hydraulic outreach Max rated capacity	hook [S2]		*kg*	6090	5865	5550
	grab [S1]		*kg*	6090	5865	5550
	min.outreach		*m*	3.73	3.73	3.81
Capacity at max. hydraulic outreach	hook [S2]		*kg*	3190	2305	1710
	grab [S1]		*kg*	3190	2305	1710
	max.outreach		*m*	7.03	9.10	11.25
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*	9.4	11.4	13.6
	manual		*m*	N/A	N/A	N/A
Weight of crane without stabilizers			*kg*	2245	2385	2525
Weight of stabilizers		ST-M	*kg*	285		
		EX-H	*kg*	355		
		SE-H	*kg*	510		
Weight of 1st man. extension			*kg*	N/A	N/A	N/A
Max. working pressure			*bar*	320		
Max. oil flow rate			*ℓ/min*	50		
			ℓ/min	80		
Max. power needed			*kW*	34.6		
			kW	55.4		
Oil tank capacity			*ℓ*	130		
Slewing angle			°	415°		
Gross slewing torque			*daNm* *kNm*	2600 26.0		
Max. base inclination			°	4°		
			°	3°		
Max. stabilizer force on the ground with stabilizers fully extended		ST	*daN*	12090		
		EX	*daN*	10600		
		SE	*daN*	7740		
Max. stabilizer pressure on the ground with stabilizers fully extended		ST	*MPa*	3.18		
		EX	*MPa*	2.79		
		SE	*MPa*	2.04		
Lifting coversion factor, k			*kgm/bar*	85.10		
Distribution factor of dyn. moment on base, β			-	0.70		
Position of standard dead point (see D.5)			▲			

D.2 TOTAL WEIGHTS

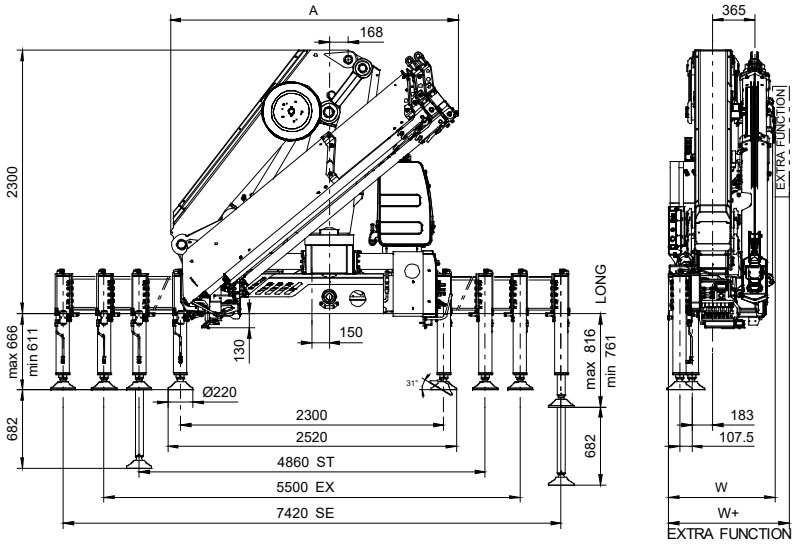
The table shows the total weights including oil inside the cylinders (fully retracted) and considering oil tank empty.

kg	Crane version		
Type of stabilizers	**2S**	**3S**	**4S**
ST-M	2530	2670	2810
EX-H	2600	2740	2880
SE-H	2755	2895	3035

The weights may vary by ± 3%
Additional weight for TC2 winch: 150 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

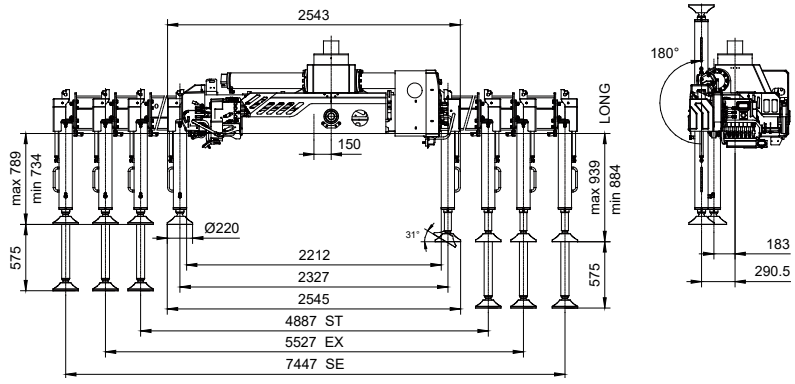
D.3 OVERALL DIMENSIONS

FIXED STABILIZERS LEGS

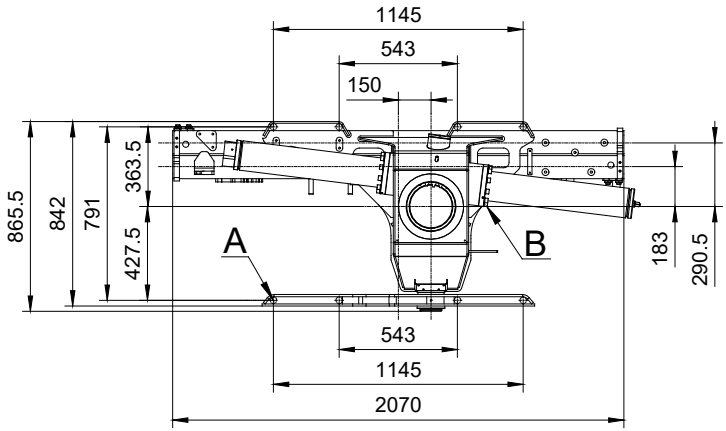


		2S	3S	4S
A (mm)		2280	2420	2520
W (mm)		930	930	930
W+ (mm)	compact	N/A	N/A	930
	slides	1055	1055	1055

TURNING STABILIZERS LEGS



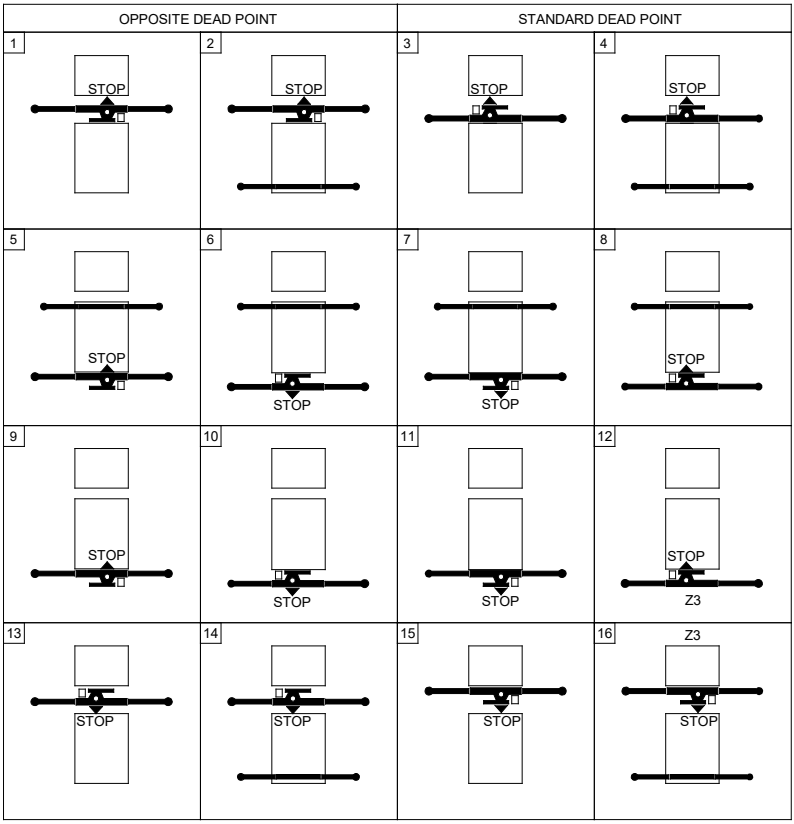
D.4 BASE DIMENSIONS AND MOUNTING BOLTS



Ref.	Description	Q.ty	Material Grade	Size (Q.ty)	Tightening torque
A	Kit with 8 crane mounting bolts	8	42CrMo4+QT EN 10083-3	M24x2 L=1100 (4) L=1015 (4)	400 Nm
	Kit with 4 crane mounting bolts	4	42CrMo4+QT EN 10083-3	M30x2 L=1000 (2) L=1100 (2)	700 Nm
B	Fixing bolts for each slewing cylinder	10	8.8	M14x2 L=75	80 Nm

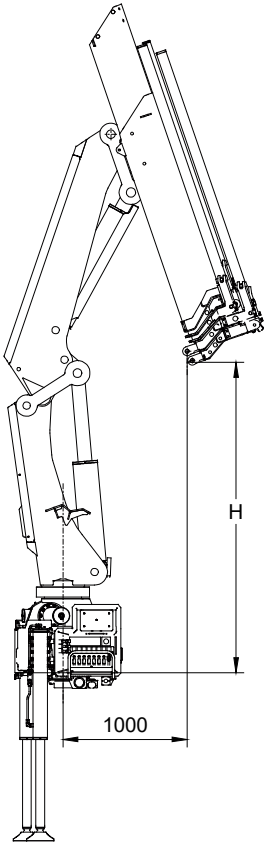
D.5 INSTALLATION TYPE NUMBER

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



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

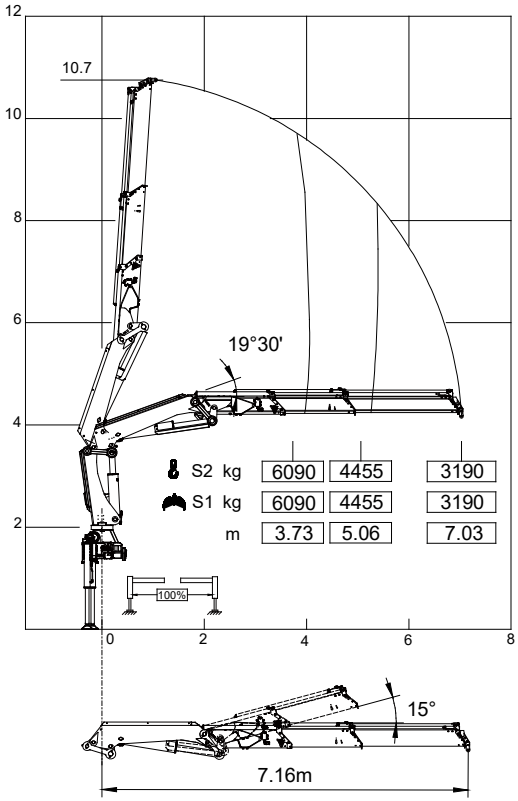
D.6 LIFTING HEIGHT CLOSE TO THE COLUMN



Version	H mm
2S	2578
3S	2578
4S	2489

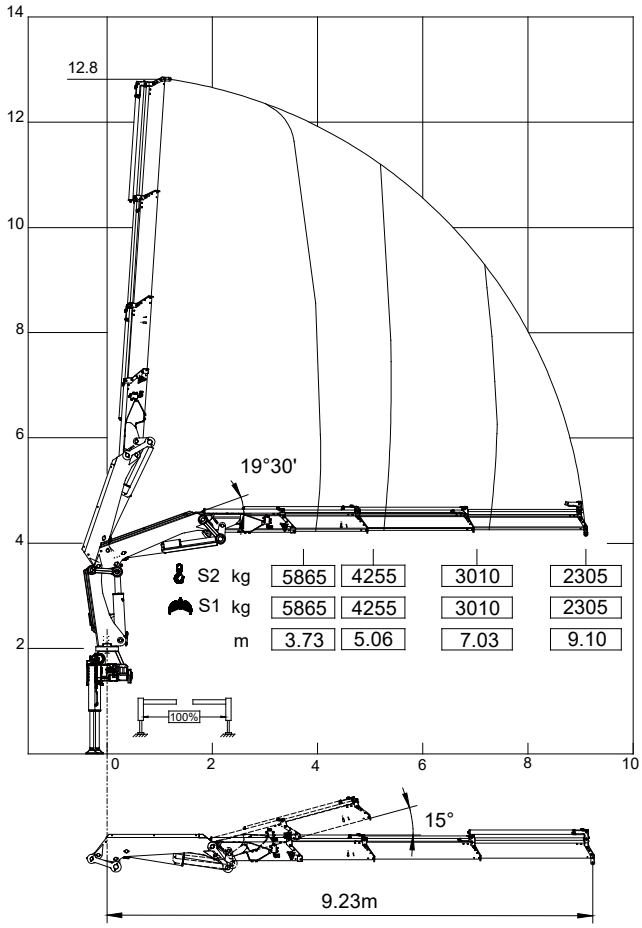
D.7 LOAD CHARTS FOR USE WITH HOOK/TOOL

924NG C 2S



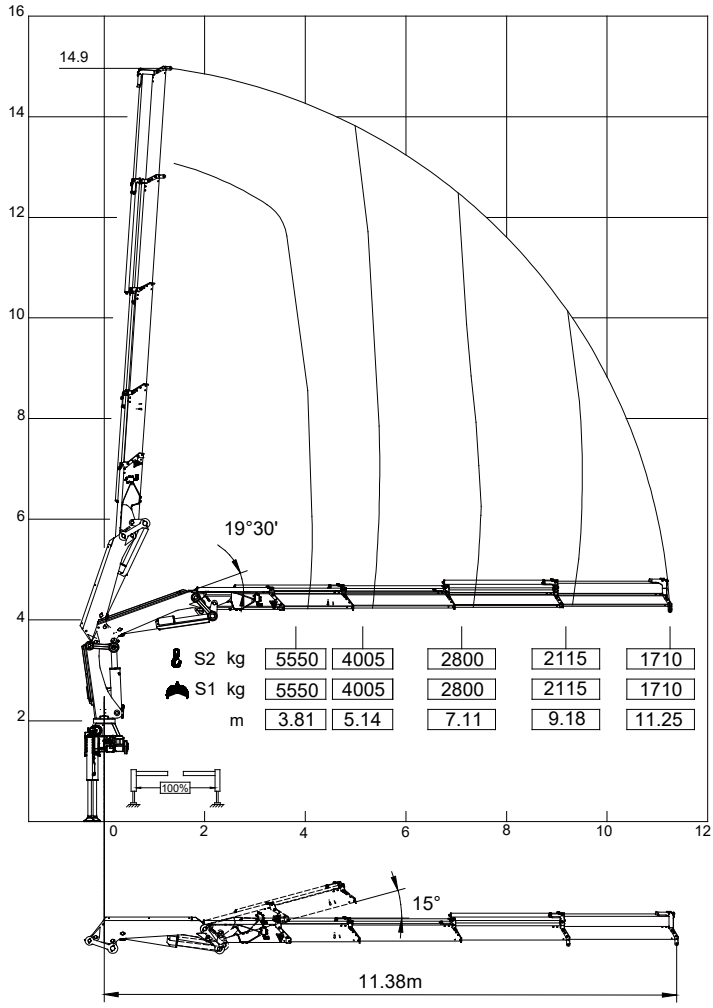
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

LOAD CHART FOR USE WITH HOOK/TOOL
924NG C 3S



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

LOAD CHART FOR USE WITH HOOK/TOOL
924NG C 4S

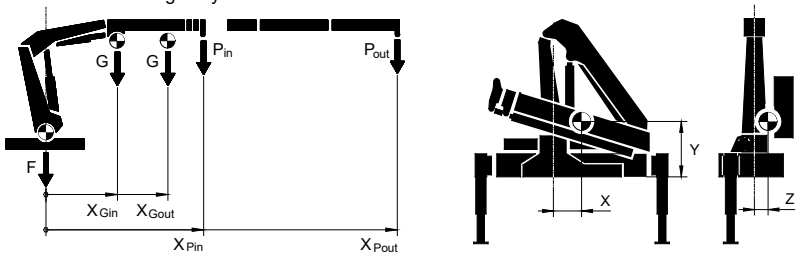


If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

D.8 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

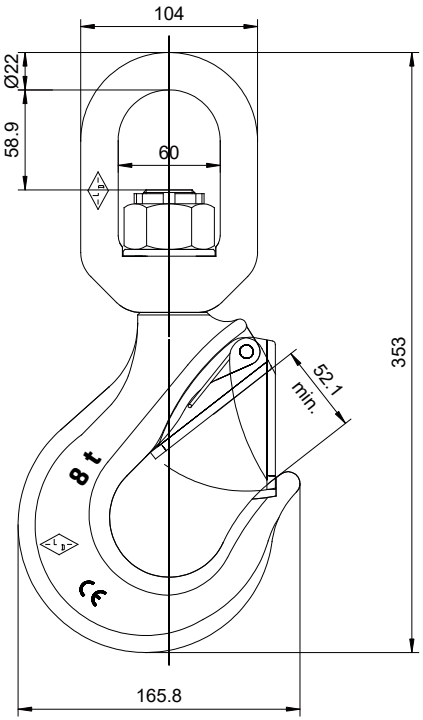
924NG C	F kg	G kg	X_G in / out m	P in / out kg	X_P in / out m	TL kg	X	Y mm	Z
2S	ST-M : 1510 EX-M : 1535 EX-H : 1580 SE-H : 1735	1020	1.86 2.60	6090 3190	3.73 7.03	3988	215	811	18
3S		1160	1.94 3.20	5865 2305	3.73 9.10	2881	212	824	36
4S		1300	2.02 3.96	5550 1710	3.81 11.25	2144	196	846	55

The data are relating to crane configuration with horizontal booms.

D.9 HOOK DATA

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

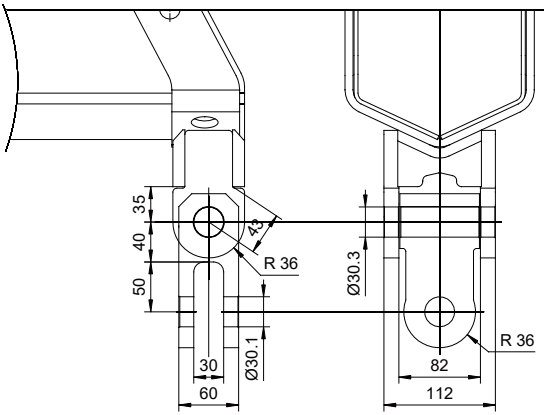
DIMENSIONS

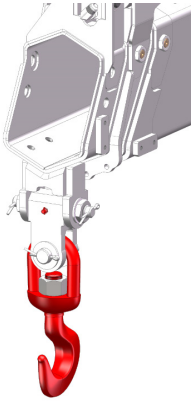


TECHNICAL PROPERTIES
Working load limit (WLL) : 8000 kg
Material: alloy steel
Weight: 6.2 kg
Swivel hook
Reference standard: DIN 15401

D.10 LOAD ATTACHMENT

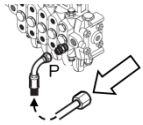
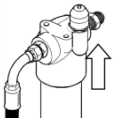
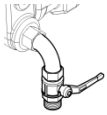
ATTACHMENT FOR HOOK AND LIFTING TOOL





D.11 HYDRAULIC SYSTEM

FITTINGS FOR CONNECTION TO PUMP

924NG C	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

924NG C	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)	18	21

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.

924NG C	Time interval min.	Max. load descent mm
2S	10	352
3S	10	455
4S	10	563

CAPACITY OF HYDRAULIC SYSTEM

924NG C	Cylinders extended ℓ	Cylinders retracted ℓ
2S	73	46
3S	80	51
4S	88	56

Capacities do not include the oil tank.

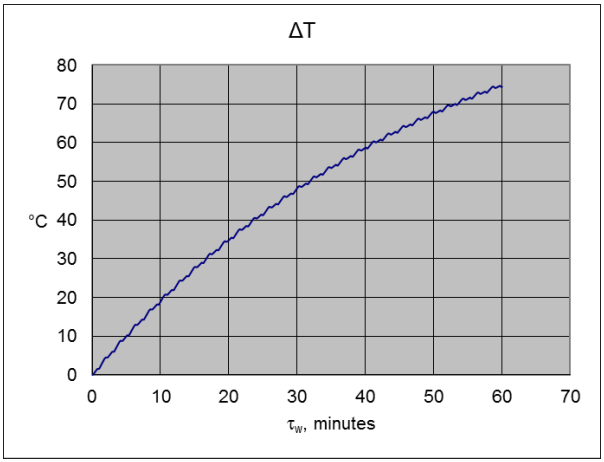
ADDITIONAL CAPACITY FOR HYDRAULICALLY OPERATED STABILIZER EXTENSIONS

EX-H	+4.0	+2.5
SE-H	+6.5	+3.5

D.12 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

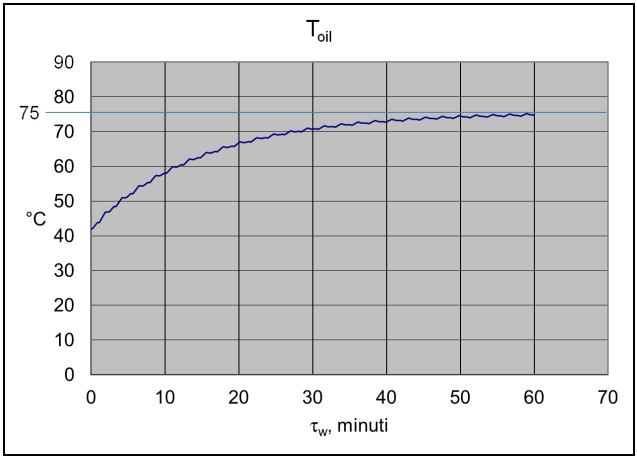
$$T_{env} + \tau_w > 57$$

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:

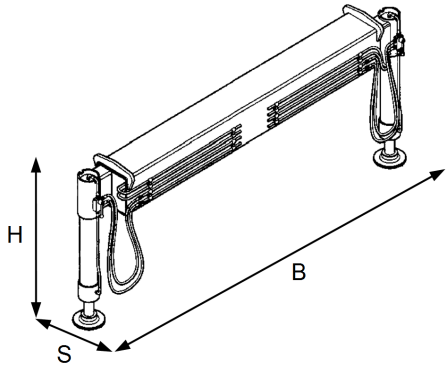
T_{env} (°C)	τ_w to exceed 75 °C (minutes)
42	no limit
45	35
48	25
50	21
52	18
54	15

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.13 ADDITIONAL STABILIZERS

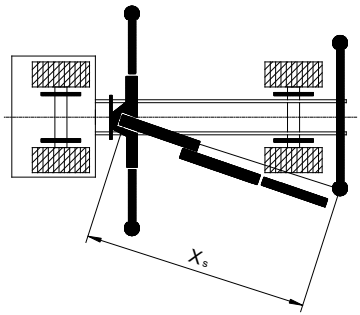


Additional stabilizers must be chosen so that:
- the installation is stable (see Installer Manual)
- the max. force acting on the additional stabilizers, F_s, is lower than the max. load allowed by the stabilizers itself, R_{max}.

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

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 crane's manufacturer.

Code	Spread (m)	Weight (kg)	R_{max} (kg)	Overall dimensions BxHxS (mm)
7850106	3.33	270	8200	2334x930x220
7850107	3.33	260	8200	2334x840x220
7850105	4.74	390	8250	2346x930x400
7850121	4.74	380	8250	2346x840x400
7850103	5.02	570	12700	2420x1095x430
7850104	5.02	540	12700	2420x970x430

For further information see the User Manual for outriggers.

D.14 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	3190	H605-650	410	650	975	**2780**	43%	100%
3S	2305	H605-650	410	650	975	**1895**	60%	100%
4S	1710	H605-650	410	650	975	**1300**	81%	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	3190	H653-4 large	435	500	750	**2755**	37%	100%
3S	2305	H653-4 large	435	500	750	**1870**	51%	100%
4S	1710	H653-4 large	435	500	750	**1275**	69%	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	3190	H634-0,25	170	4000	**3020**	100%	76%
3S	2305	H634-0,25	170	4000	**2135**	100%	53%
4S	1710	H634-0,25	170	4000	**1540**	100%	39%

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	3190	H332-850	245	2200	**2945**	77%	100%
3S	2305	H332-850	245	2200	**2060**	100%	94%
4S	1710	H332-1300	265	1600	**1445**	100%	90%

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	3190	H415 2000-500	155	2000	**3035**	68%	100%
3S	2305	H415 2000-500	155	2000	**2150**	93%	100%
4S	1710	H415 1500-500	135	1500	**1575**	96%	100%

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