D TECHNICAL SHEET

D.1 CRANE'S TECHNICAL DATA

Versions				2S	3S	4S	5S	6S
Max. net lifting moment			*t m* *kNm*	21.7 213	21.2 208	20.7 203	20.3 199	20.0 196
Max. dynamic moment			*daNm* *kNm*	24960 249.6				
Capacity at min. hydraulic outreach Max rated capacity	hook [S2]		*kg*	4990	4865	4675	4495	4345
	grab [S1]		*kg*	4990	4865	4675	4495	4345
	min. outreach		*m*	4.35	4.35	4.43	4.51	4.60
Capacity at max. hydraulic outreach	hook [S2]		*kg*	2560	1915	1460	1130	895
	grab [S1]		*kg*	2560	1915	1460	1130	895
	max. outreach		*m*	8.29	10.36	12.51	14.72	17.01
Capacity of 1st man. extension	capacity		*kg*	N/A	1460	1130	890	755
	max. outreach		*m*	N/A	12.51	14.72	17.01	19.11
Max. load height above the base for the last extension	hydraulic		*m*	10.6	12.7	14.8	17.0	19.3
	manual		*m*	N/A	19.3	21.4	21.4	21.4
Weight of crane without stabilizers			*kg*	2370	2520	2670	2790	2885
Weight of stabilizers		EX-H	*kg*	370				
		SE-H	*kg*	500				
Weight of 1st man ext.			*kg*	N/A	90	67	48	41
Max. working pressure			*bar*	345				
Max. oil flow rate			*ℓ/min*	70				
Power needed			*kW*	52.3				
Oil tank capacity			*ℓ*	130				
Slewing angle			°	endless				
Gross slewing torque	1 gear motor		*daNm* *kNm*	2300 23.0				
Gross slewing torque	2 gear motors		*daNm* *kNm*	4050 40.5				
Max boom inclination for use with CE winch			°	75				
Max. base inclination			°	4				
			°	3				
Max. stabilizer force on the ground with stabilizer fully extended		EX	*daN*	9600				
		SE	*daN*	7015				
Max. stabilizer pressure on the ground with stabilizer fully extended		EX	*MPa*	2.53				
		SE	*MPa*	1.84				
Lifting coversion factor, k			*kgm/bar*	75.66				
Distribution factor of dyn. moment on base, β			-	0.82				
Position of standard dead point (see D.6)			▲					

Versions				3SJ3	4SJ3	5SJ2
Max. net lifting moment			*t m* *kNm*	17.5 172	17.4 170	11.7 115
Max. dynamic moment			*daNm* *kNm*	24690 246.9		24590 245.9
Capacity at min. hydraulic outreach Max rated capacity	hook [S2]		*kg*	2390	2370	1240
	grab [S1]		*kg*	N/A	N/A	N/A
	min. outreach		*m*	7.35	7.35	7.20
Capacity at max. hydraulic outreach	hook [S2]		*kg*	605	520	490
	grab [S1]		*kg*	N/A	N/A	N/A
	max. outreach		*m*	18.56	20.11	20.27
Capacity of 1st man. extension	capacity		*kg*	515	455	390
	max. outreach		*m*	20.43	21.77	21.83
Max. load height above the base for the last extension	hydraulic		*m*	20.9	22.4	22.6
	manual		*m*	24.6	25.8	24.1
Weight of crane without stabilizers		KG	*kg*	3180	3160	3065
Weight of stabilizers		EX-H	*kg*	370		
		SE-H	*kg*	500		
Weight of 1st man ext.			*kg*	35	30	22
Max. working pressure			*bar*	N/A	N/A	N/A
Max. oil flow rate			*ℓ/min*	70		
Power needed			*kW*	N/A	N/A	N/A
Oil tank capacity		OIL	*ℓ*	130		
Slewing angle			°	endless		
Gross slewing torque	1 gear motor		*daNm* *kNm*	2300 23.0		
Gross slewing torque	2 gear motors		*daNm* *kNm*	4050 40.5		
Max boom inclination for use with CE winch			°	75		
Max. base inclination			°	3		
			°	N/A		
Max. stabilizer force on the ground with stabilizer fully extended		EX	*daN*	9500		9460
		SE	*daN*	6935		6910
Max. stabilizer pressure on the ground with stabilizer fully extended		EX	*MPa*	2.50		2.49
		SE	*MPa*	1.82		1.82
Lifting coversion factor, k			*kgm/bar*	75.66		
Distribution factor of dyn. moment on base, β			-	0.82		
Position of standard dead point (see D.6)			▲			

D.2 WINCH SETTINGS

TI1 - SINGLE LINE PULL

Versions	2S	3S	4S	5S	6S	3SJ3	4SJ3	5SJ2
Max line pull *kg*	N/A	N/A	N/A	N/A	N/A	1000	1000	1000
Start angle - pull% Final angle - pull%	-	-	-		-	-	-	-

TI2 - SINGLE LINE PULL

Versions	2S	3S	4S	5S	6S	3SJ3	4SJ3	5SJ2
Max line pull *kg*	2000	2000	2000	2000 (*)	2000 (*)	N/A	N/A	N/A
Start angle - pull% Final angle - pull%	-	-	-	55°-92% 75°-85%	46°-61% 75°-53%	-	-	-

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

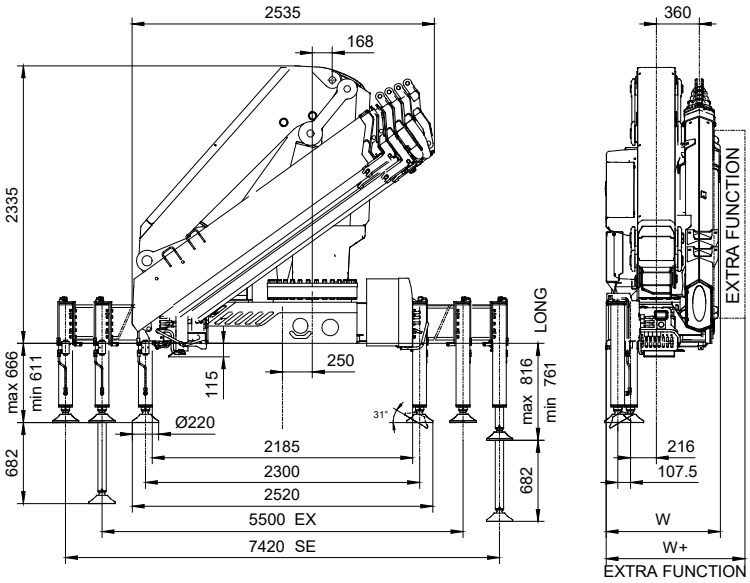
The table shows the total weights including oil inside the cylinders (fully retracted) and considering oil tank empty.

kg	Crane version							
Type of stabilizers	**2S**	**3S**	**4S**	**5S**	**6S**	**3SJ3**	**4SJ3**	**5SJ2**
EX-H	2740	2890	3040	3160	3255	3550	3530	3435
SE-H	2870	3020	3170	3290	3385	3680	3660	3565

The weights may vary by ± 3%
Additional weight for TI1 winch: 95 kg
Additional weight for TI2 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

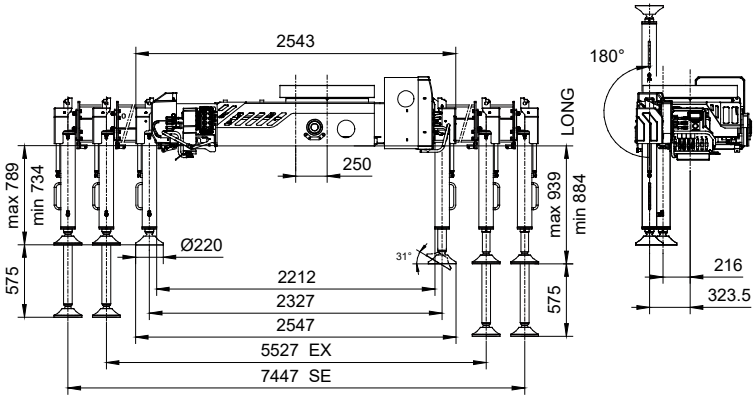
D.4 OVERALL DIMENSIONS

FIXED STABILIZERS LEGS



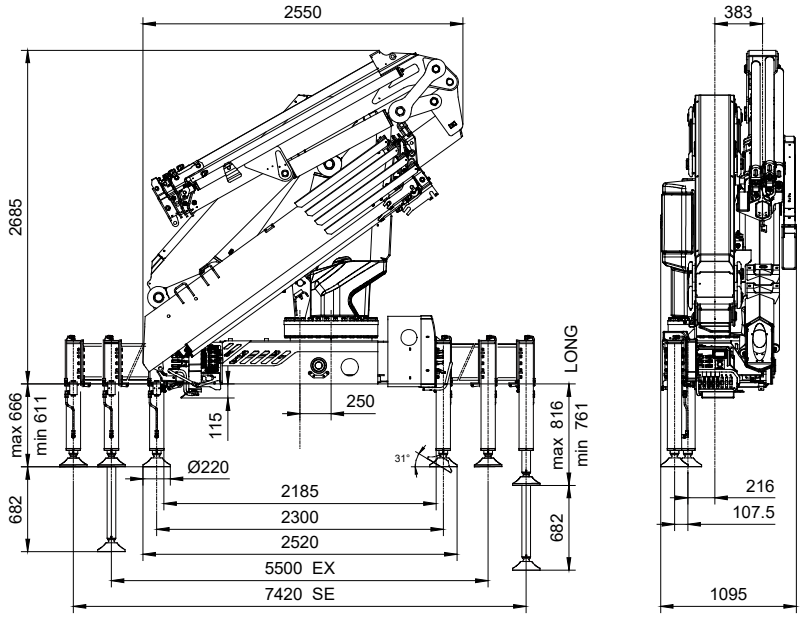
		2S	3S	4S	5S	6S
W (mm)		960	960	960	960	960
W+ (mm)	slides	1080	1080	1080	1080	1080
	hose reel	N/A	N/A	N/A	1155	1155

TURNING STABILIZERS LEGS

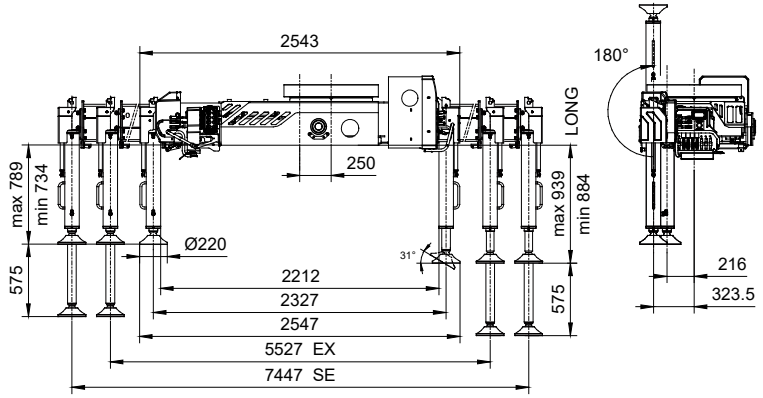


OVERALL DIMENSIONS
3SJ3

FIXED STABILIZERS LEGS

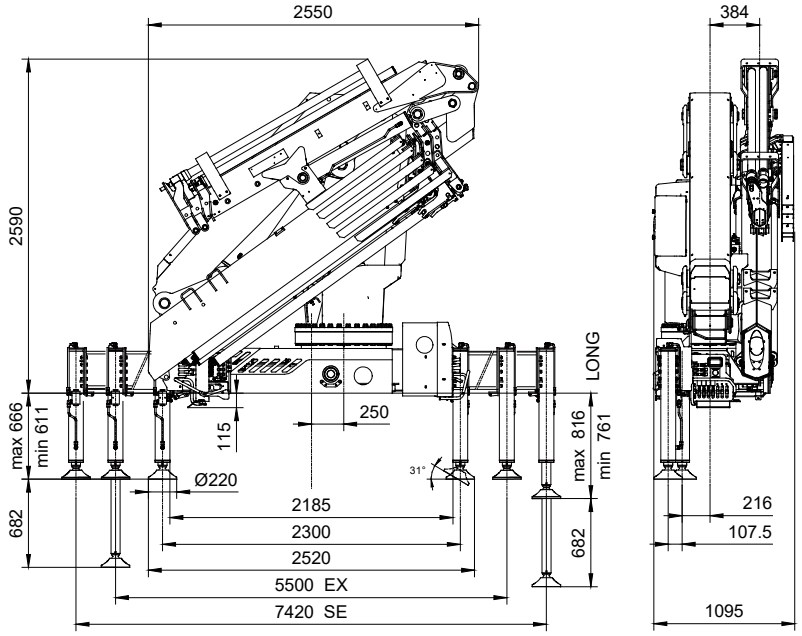


TURNING STABILIZERS LEGS

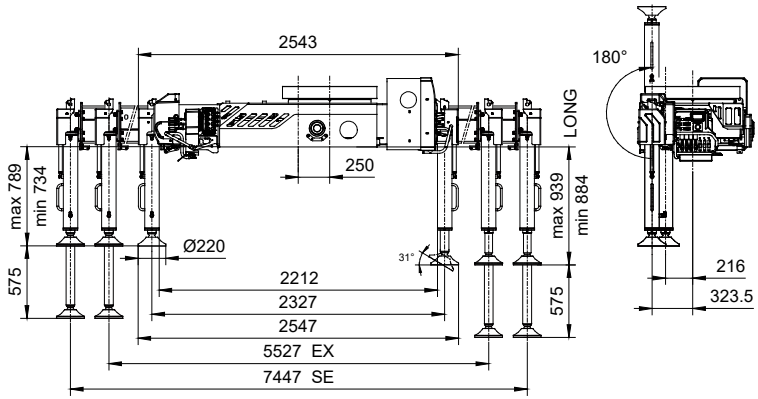


OVERALL DIMENSIONS
4SJ3

FIXED STABILIZERS LEGS

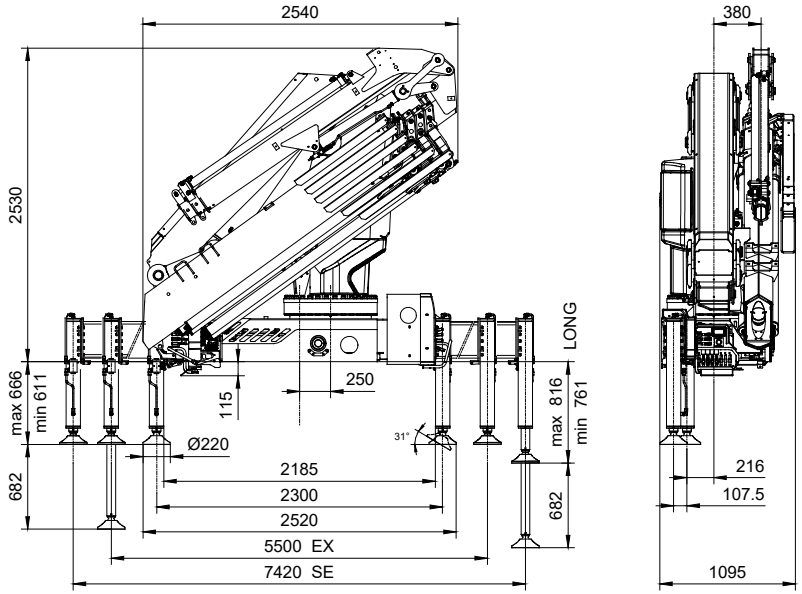


TURNING STABILIZERS LEGS

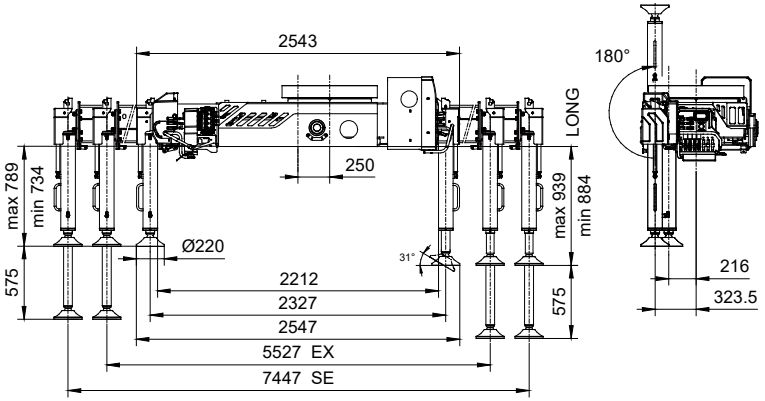


OVERALL DIMENSIONS
5SJ2

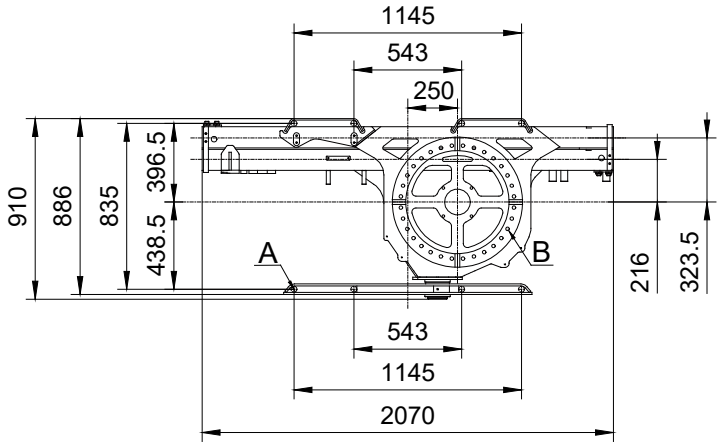
FIXED STABILIZERS LEGS



TURNING STABILIZERS LEGS



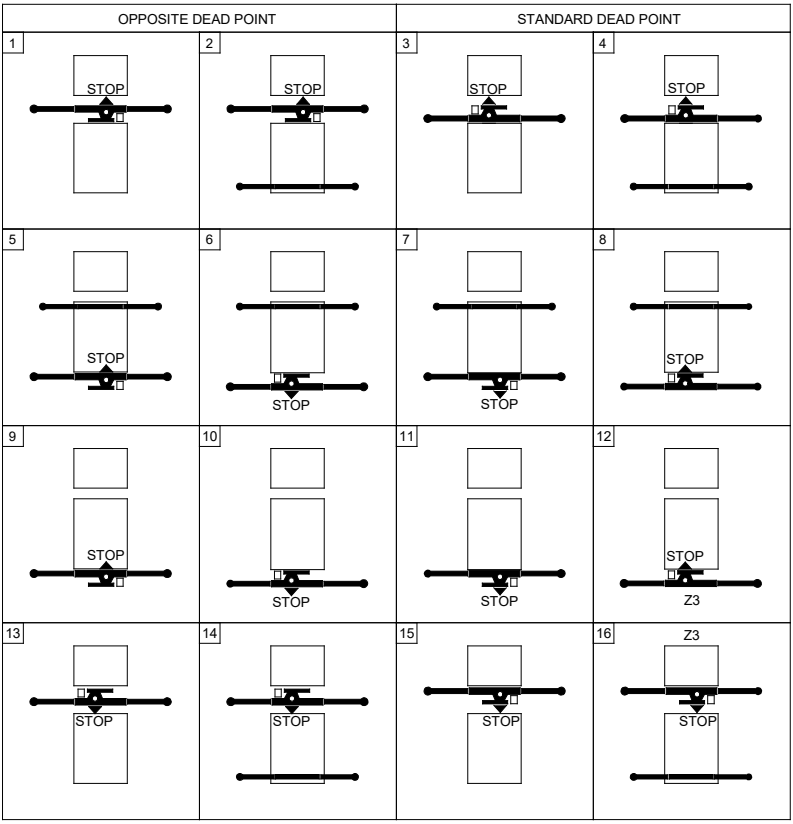
D.5 BASE DIMENSIONS AND MOUNTING BOLTS



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 slewing bearing	32	10.9	M20x2.5 L=150	484 Nm (570 Nm x 0.85) See E.4

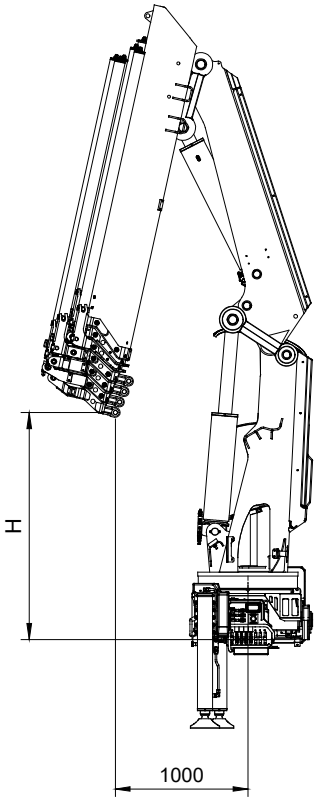
D.6 INSTALLATION TYPE NUMBER

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)

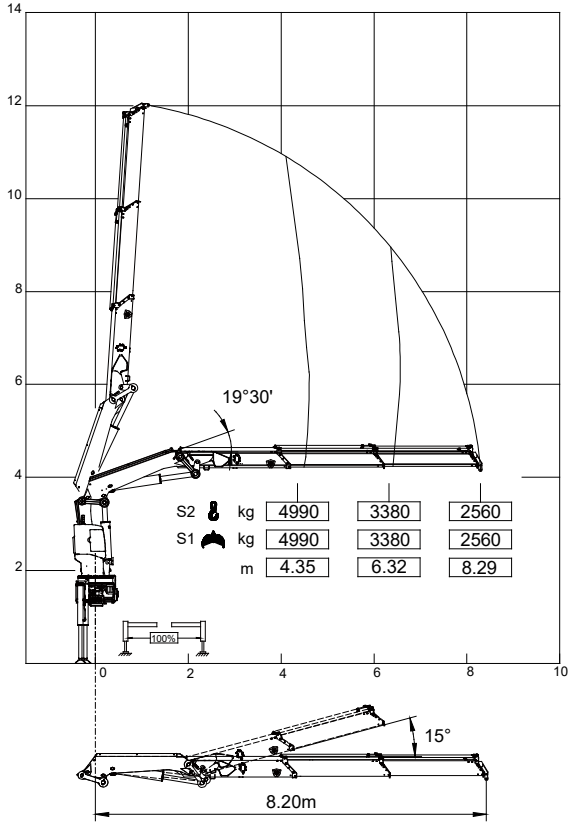
D.7 LIFTING HEIGHT CLOSE TO THE COLUMN



Version	H mm
2S	1944
3S	1944
4S	1865
5S	1795
6S	1700

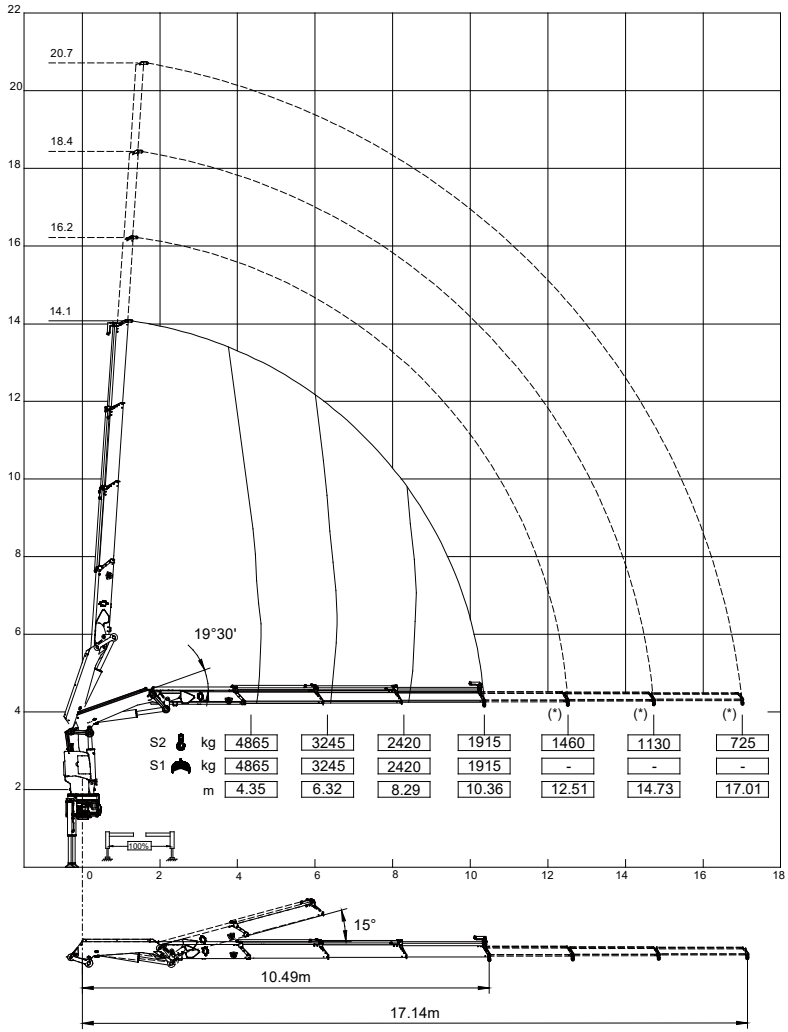
D.8 LOAD CHARTS FOR USE WITH HOOK/TOOL

VR23NG 2S



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

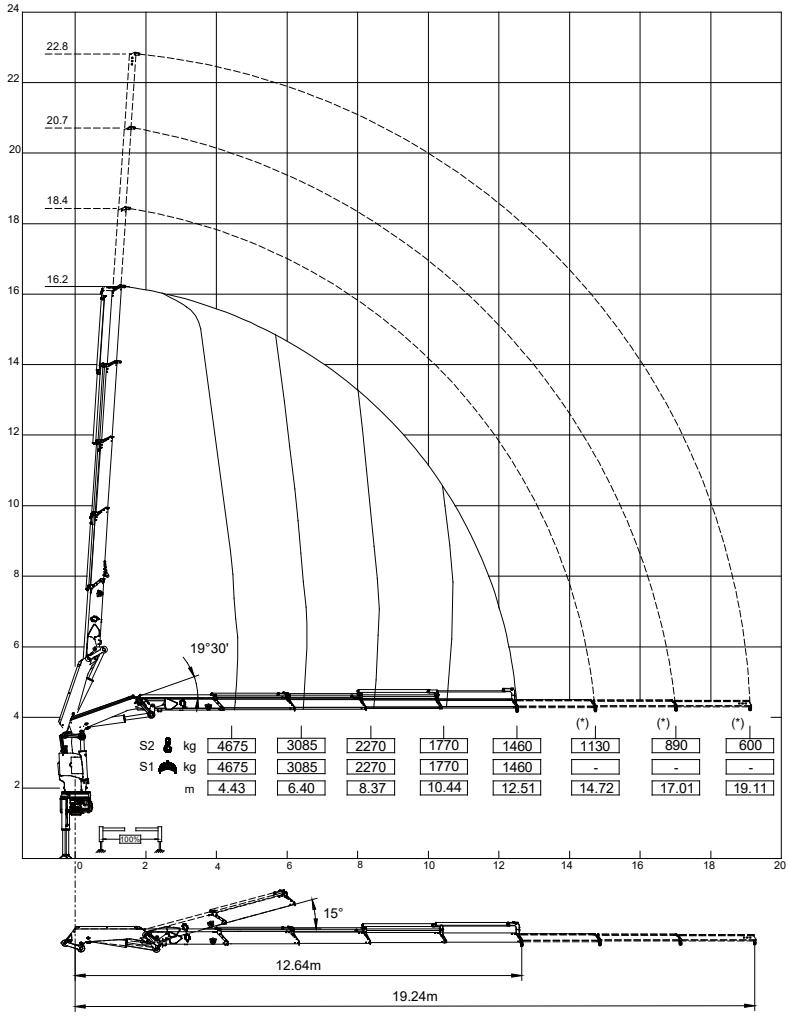
LOAD CHARTS FOR USE WITH HOOK/TOOL
VR23NG 3S



S2	kg	4865	3245	2420	1915	1460 (*)	1130 (*)	725 (*)
S1	kg	4865	3245	2420	1915	-	-	-
	m	4.35	6.32	8.29	10.36	12.51	14.73	17.01

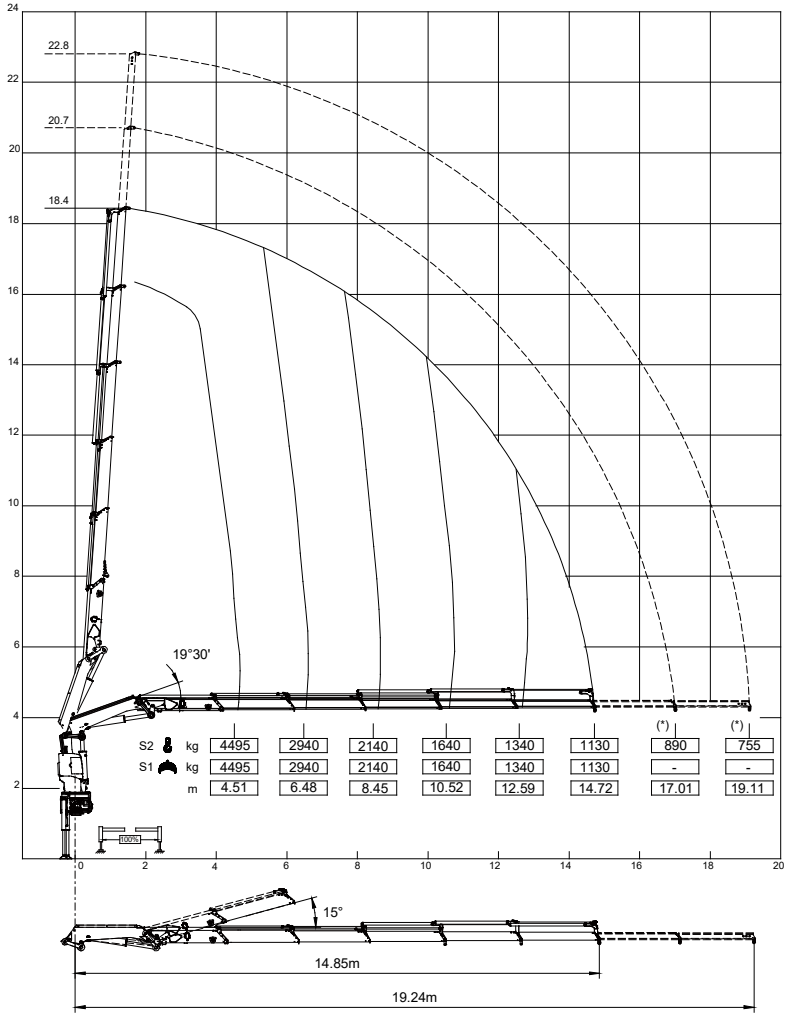
(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

LOAD CHARTS FOR USE WITH HOOK/TOOL
VR23NG 4S



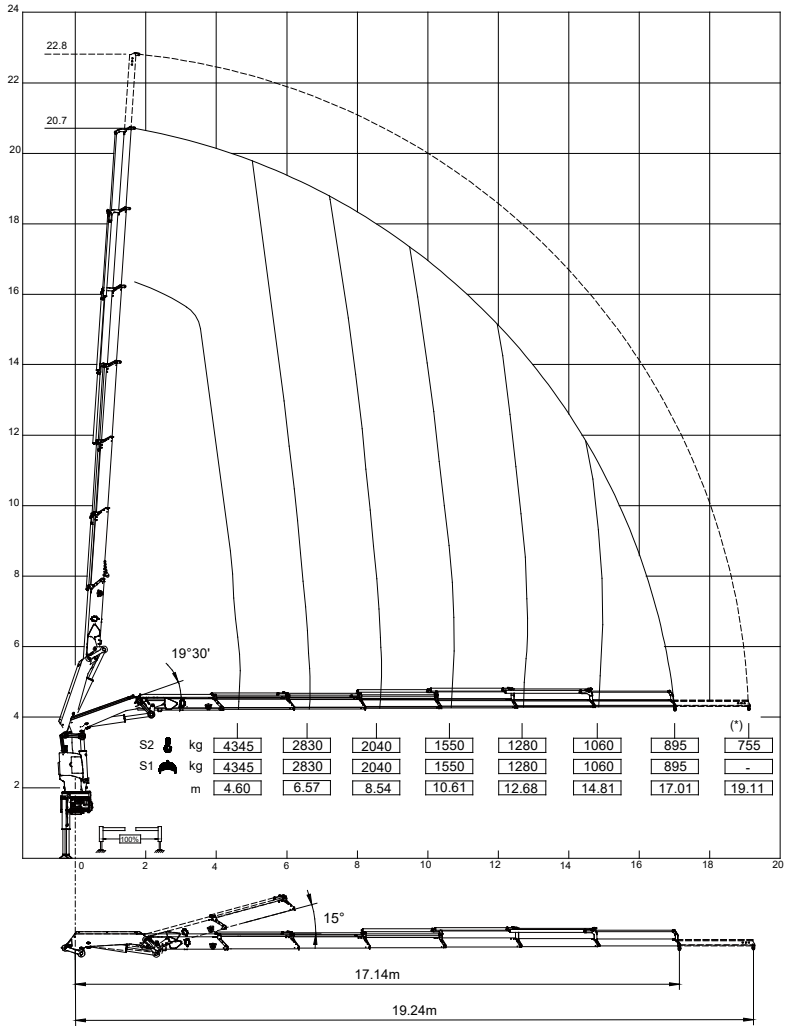
(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

LOAD CHARTS FOR USE WITH HOOK/TOOL
VR23NG 5S



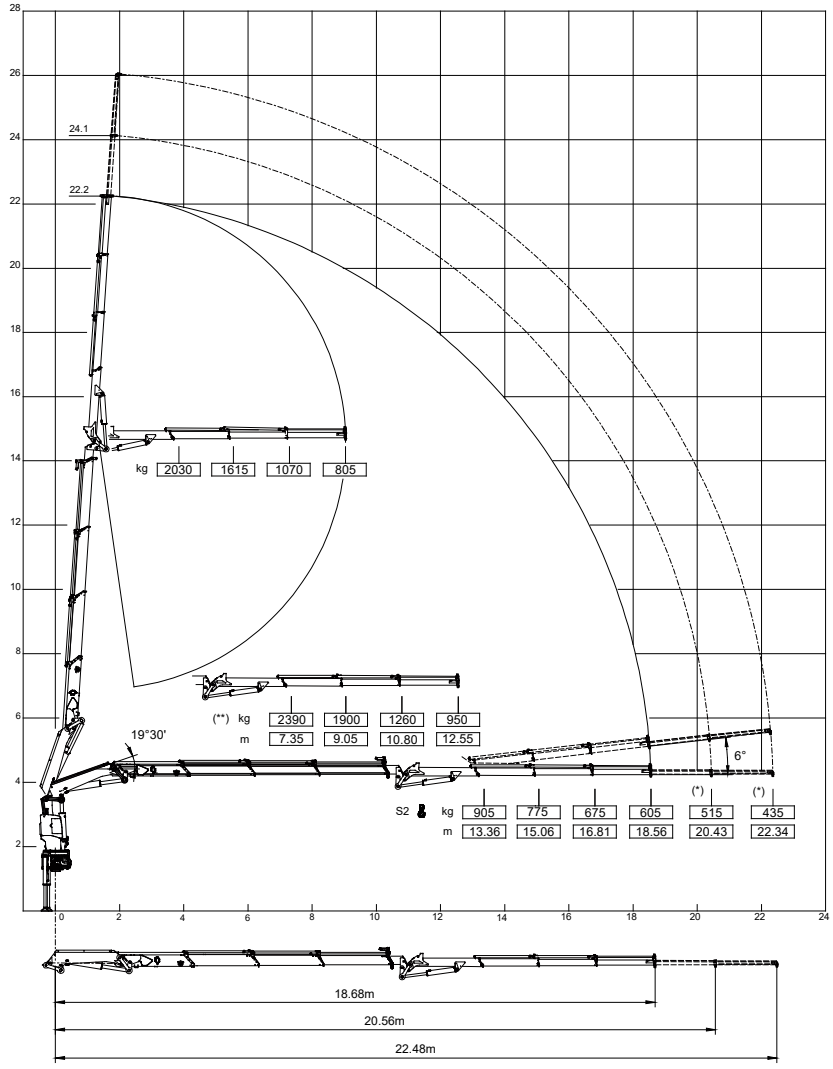
(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

LOAD CHARTS FOR USE WITH HOOK/TOOL
VR23NG 6S



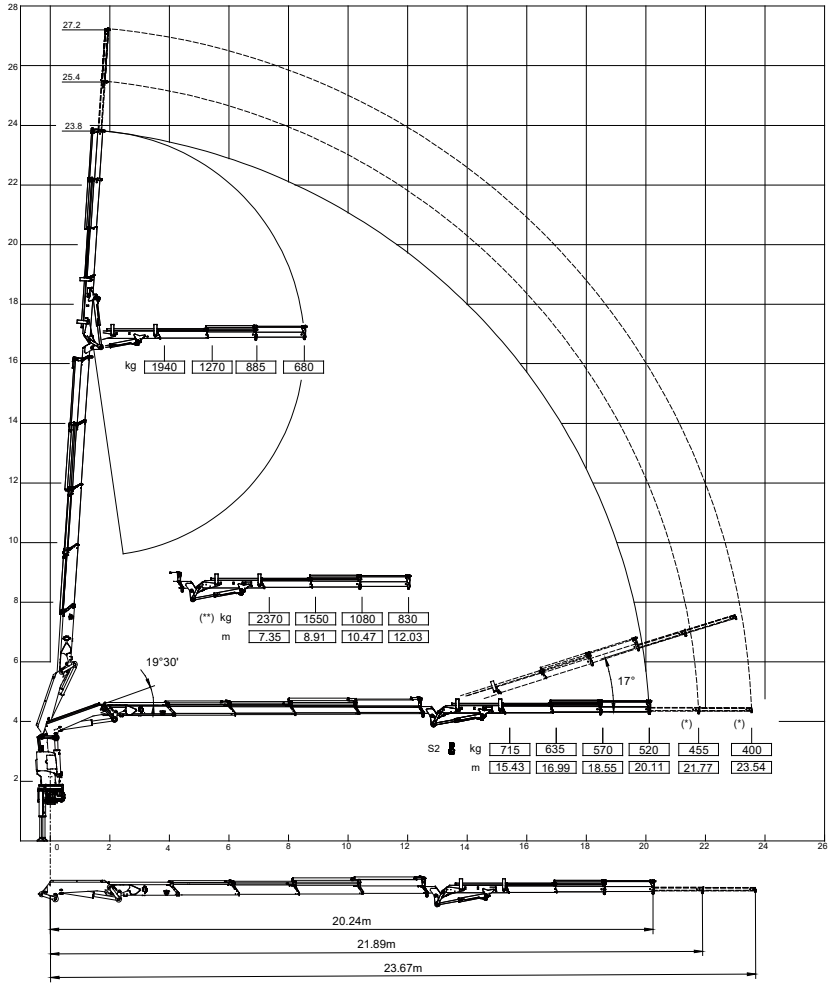
(*) Manual extensions (optional): these cannot lift additional hydraulic tools
If an additional lifting tool is mounted, the rated capacities shall be reduced by the tool's weight

LOAD CHART FOR USE WITH HOOK
VR23NG 3SJ3



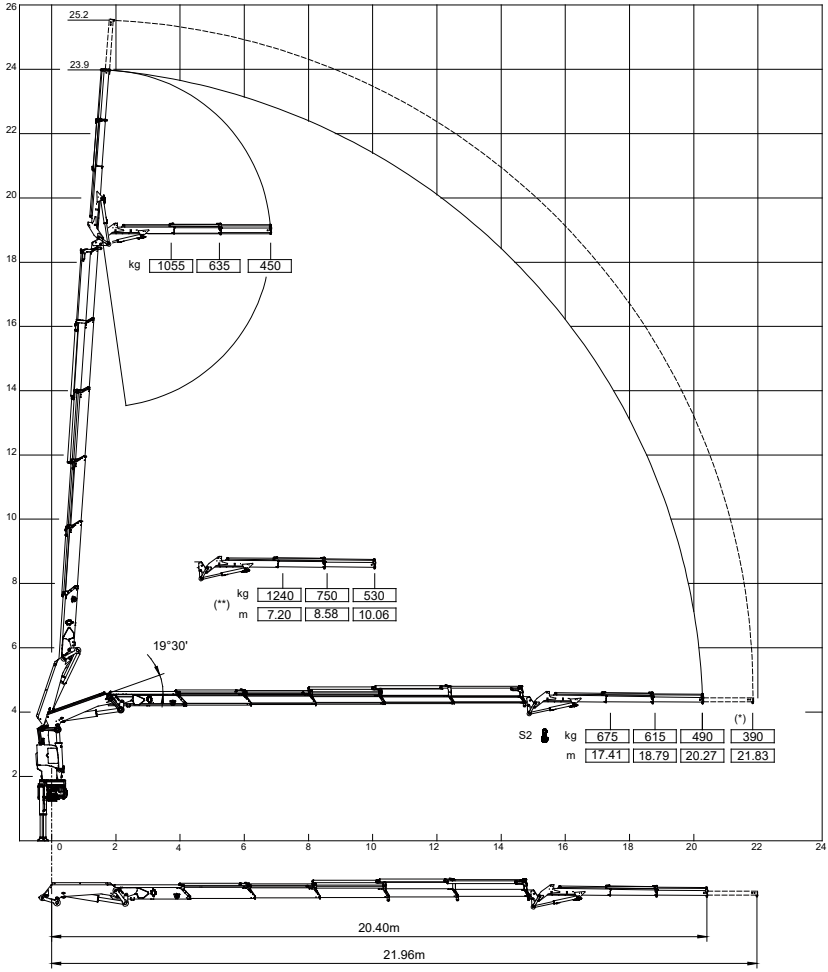
(*) Manual extensions (optional): these cannot lift additional hydraulic tools
(**) Max. lifting capacity of jib
The given rated capacities can be moved only by operating the jib.

LOAD CHART FOR USE WITH HOOK
VR23NG 4SJ3



(*) Manual extensions (optional): these cannot lift additional hydraulic tools
(**) Max. lifting capacity of jib
The given rated capacities can be moved only by operating the jib.

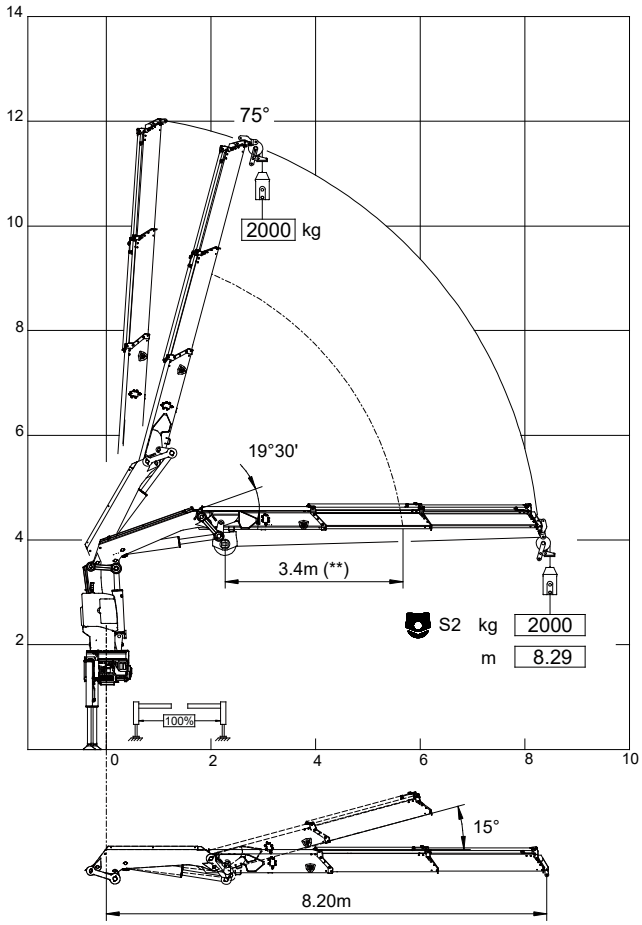
LOAD CHART FOR USE WITH HOOK
VR23NG 5SJ2



(*) Manual extensions (optional): these cannot lift additional hydraulic tools
(**) Max. lifting capacity of jib
The given rated capacities can be moved only by operating the jib.

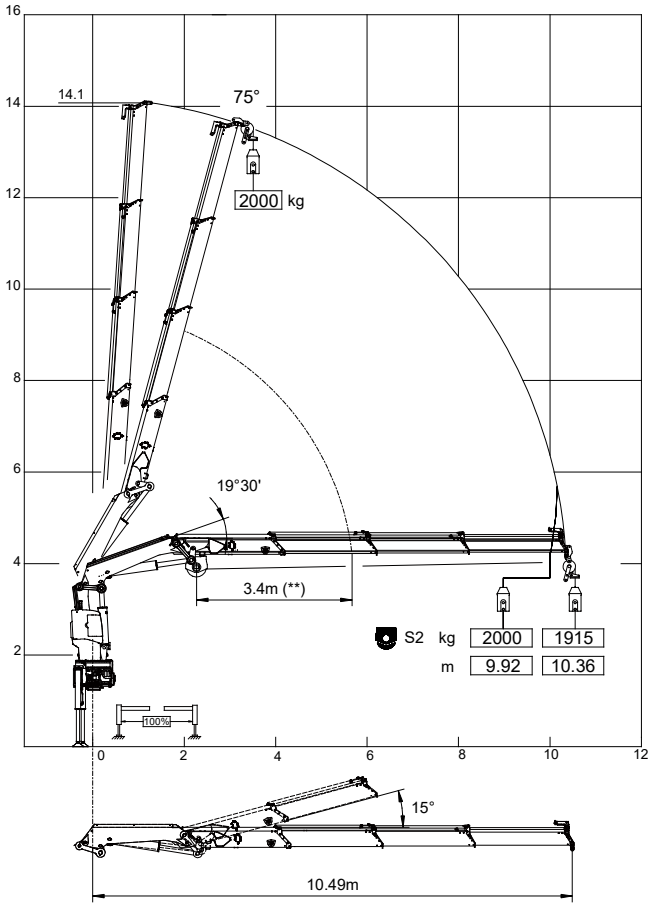
D.9 LOAD CHARTS FOR TI2 WINCH IN SINGLE LINE

VR23NG 2S + TI2 SINGLE LINE



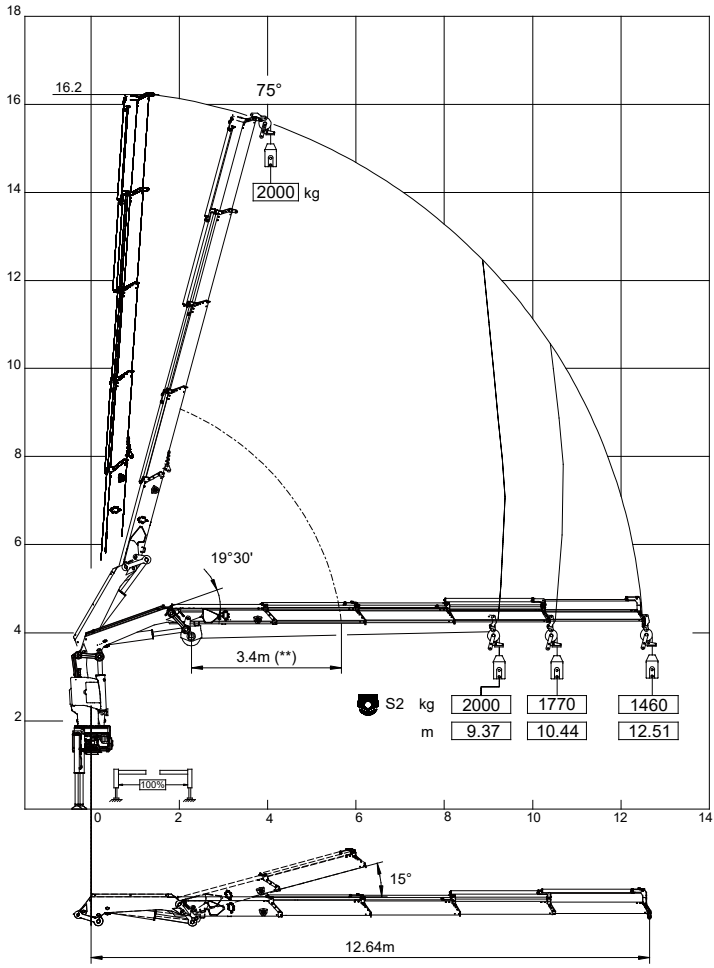
(**) Minimum distance winch - pulley
Winch max. pull: 2000 kg

LOAD CHART FOR WINCH TI2 IN SINGLE LINE
VR23NG 3S + TI2 SINGLE LINE



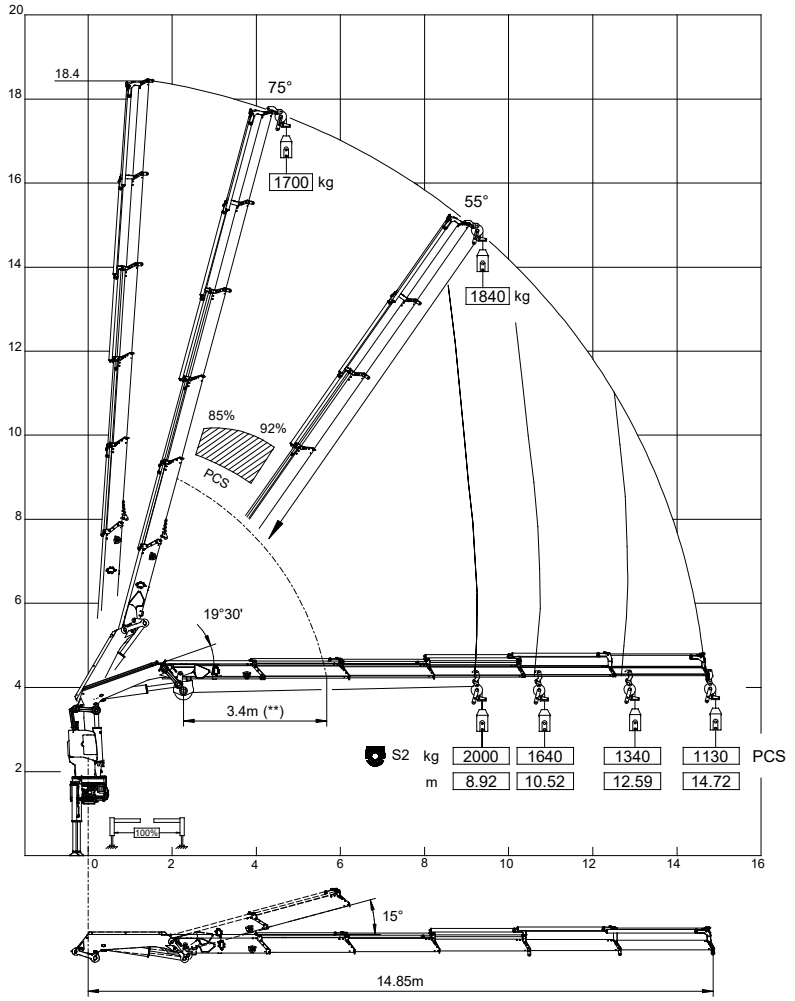
(**) Minimum distance winch - pulley
Winch max. pull: 2000 kg

LOAD CHART FOR WINCH TI2 IN SINGLE LINE
VR23NG 4S + TI2 SINGLE LINE



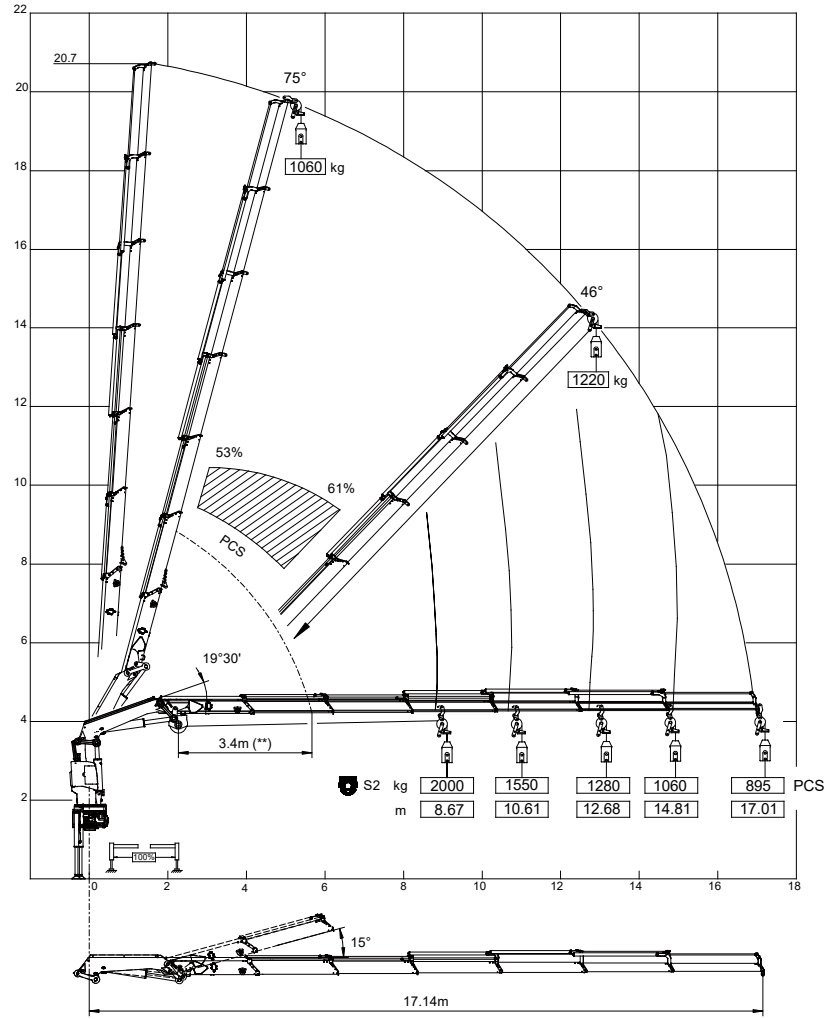
(**) Minimum distance winch - pulley
Winch max. pull: 2000 kg

LOAD CHART FOR WINCH TI2 IN SINGLE LINE
VR23NG 5S + TI2 SINGLE LINE



(**) Minimum distance winch - pulley
Winch max. pull with PCS: 2000 kg
PCS: Pull Control System, present on CE/TOP cranes

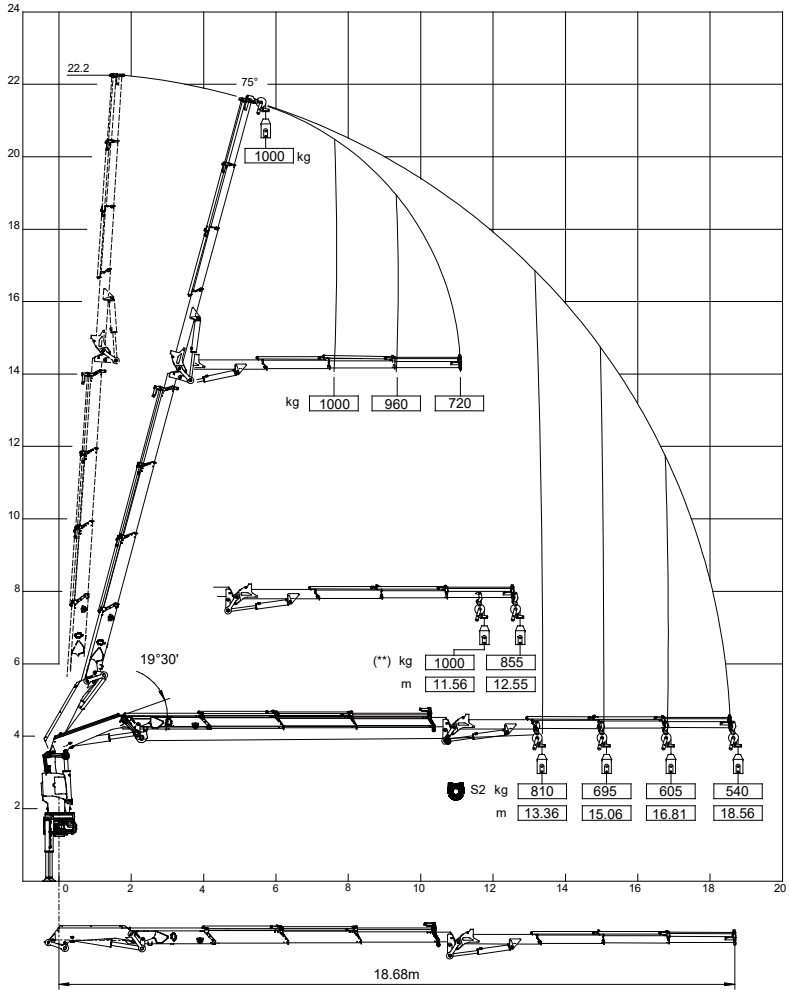
LOAD CHART FOR WINCH TI2 IN SINGLE LINE
VR23NG 6S + TI2 SINGLE LINE



(**) Minimum distance winch - pulley
Winch max. pull with PCS: 2000 kg
PCS: Pull Control System, present on CE/TOP cranes

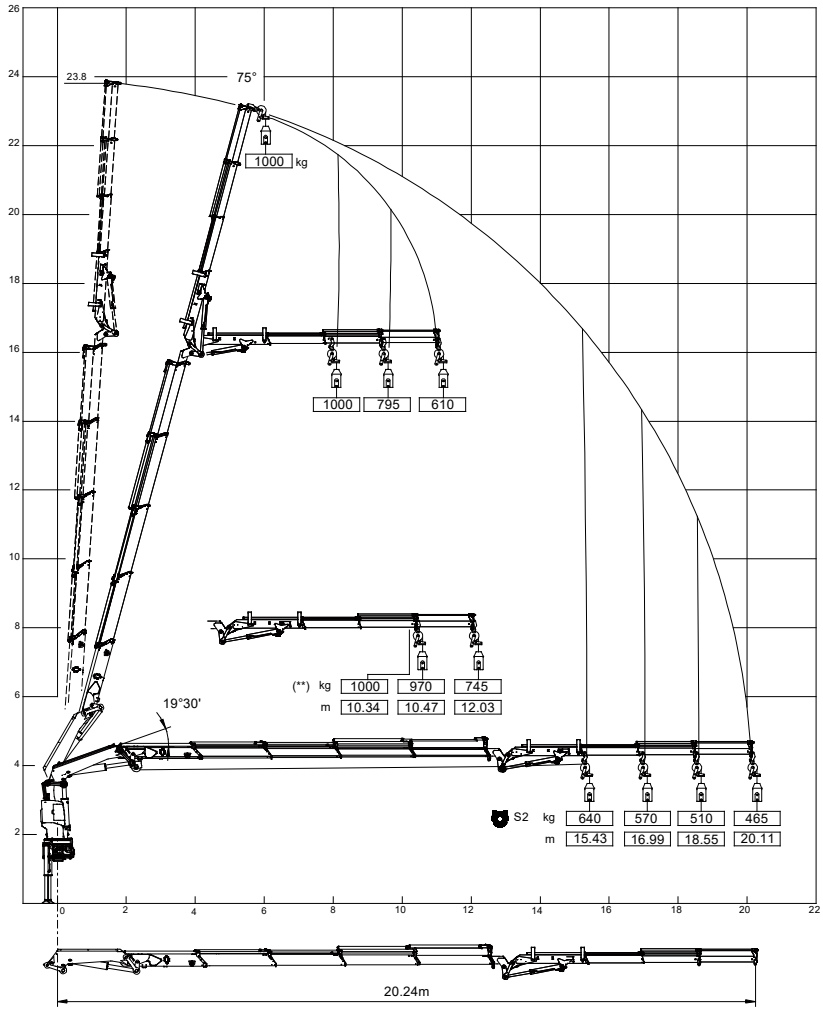
D.10 LOAD CHARTS FOR TI1 WINCH IN SINGLE LINE

VR23NG 3SJ3 + TI1 SINGLE LINE



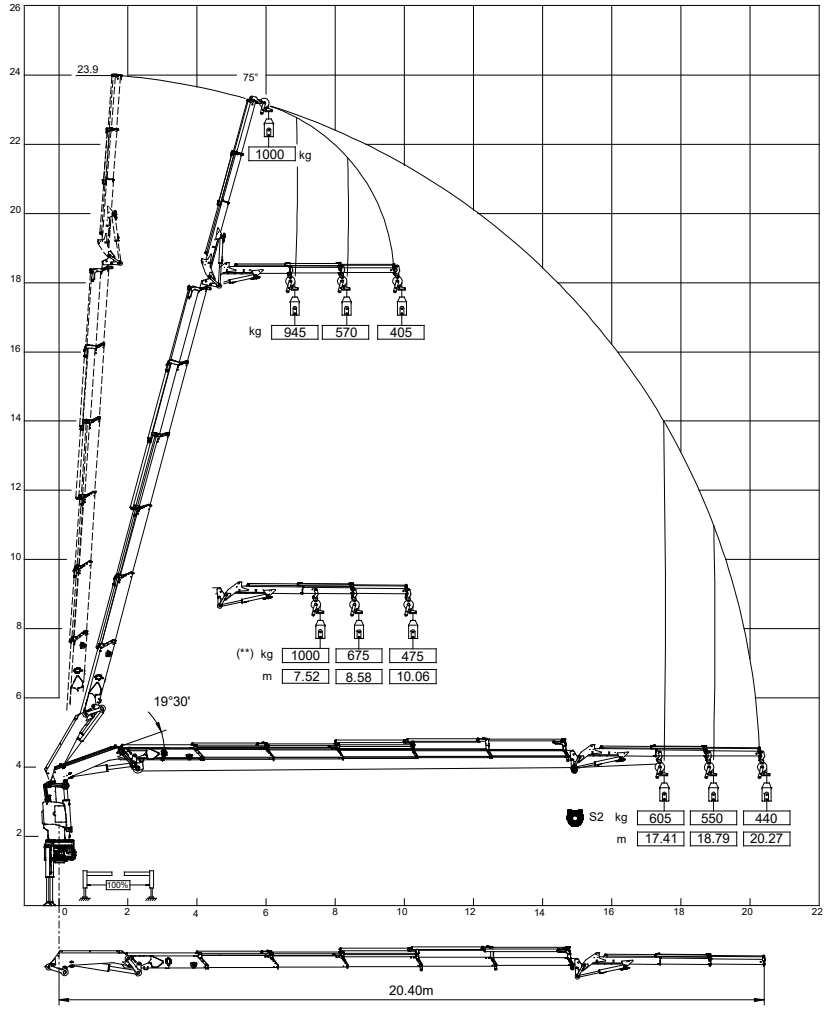
(**) Max. lifting capacity of jib
Winch max. pull: 1000 kg

LOAD CHART FOR WINCH TI1 IN SINGLE LINE
VR23NG 4SJ3 + TI1 SINGLE LINE



(**) Max. lifting capacity of jib
Winch max. pull: 1000 kg

LOAD CHART FOR WINCH TI1 IN SINGLE LINE
VR23NG 5SJ2 + TI1 SINGLE LINE

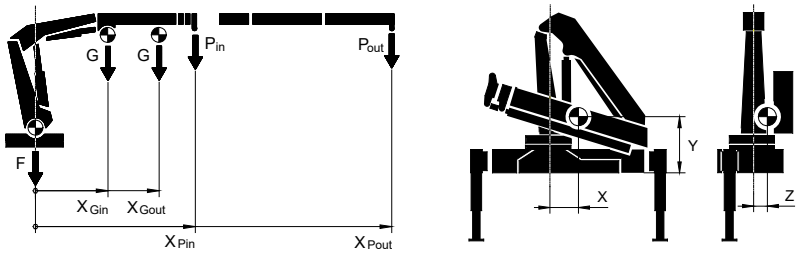


(**) Max. lifting capacity of jib
Winch max. pull: 1000 kg

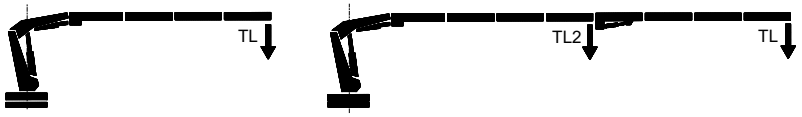
D.11 CENTERS OF GRAVITY AND TEST LOADS

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
TL2 - #S = additional test load, to be hooked to the hydraulic extension indicated in the table below
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

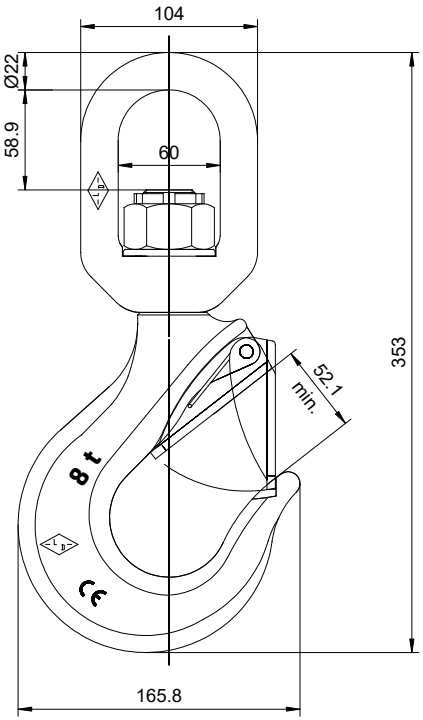
VR23NG	F	G	X_G in / out	P in / out	X_P in / out	TL (TL2 - #S)	X	Y	Z
	kg	kg	m	kg	m	kg	mm		
2S	EX-H : 1690 SE-H : 1820	1050	2.12 3.01	4990 2560	4.35 8.29	3200	263	814	14
3S		1200	2.26 3.79	4865 1915	4.35 10.36	2394	269	821	32
4S		1350	2.37 4.61	4675 1460	4.43 12.51	1851	260	838	50
5S		1470	2.46 5.36	4495 1130	4.51 14.72	1463	250	852	62
6S		1565	2.51 5.97	4345 895	4.60 17.01	1184	242	862	69
3SJ3		1860	3.45 7.04	905 605	13.36 18.56	756 (199 - 3S)	219	1046	99
4SJ3		1840	3.27 7.43	715 520	15.43 20.11	650 (177 - 4S)	217	1009	98
5SJ2		1745	2.95 7.12	675 490	17.41 20.27	613 (135 - 5S)	226	940	90

The data are relating to crane configuration with horizontal booms.
For the jib version, the "in" data are relating to standard crane's extensions always fully extracted.

D.12 HOOK DATA

HOOK MOUNTED ON STANDARD BOOM
VERSIONS: 2S, 3S, 4S, 5S, 6S

DIMENSIONS

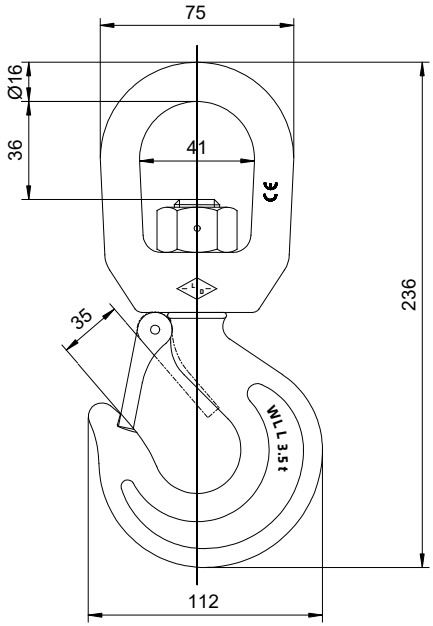


TECHNICAL PROPERTIES
Working load limit (WLL) : 8000 kg
Material: alloy steel
Weight: 6.2 kg
Swivel hook
Reference standard: DIN 15401

HOOK DATA

HOOK MOUNTED ON JIB BOOM
VERSION: 3SJ3, 4SJ3, 5SJ2

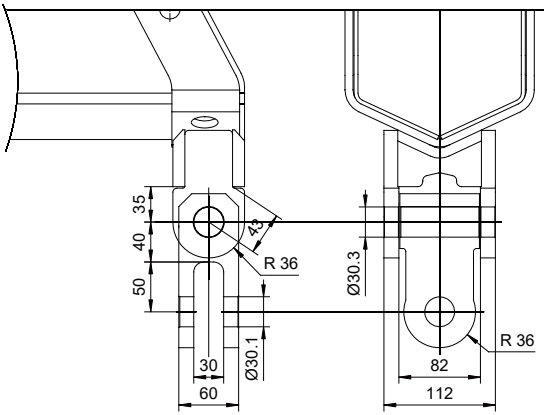
DIMENSIONS

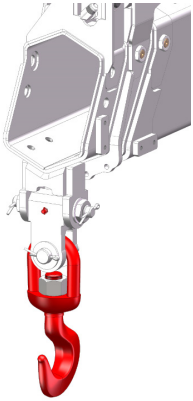


TECHNICAL PROPERTIES
Working load limit (WLL) : 3500 kg
Material: alloy steel
Weight: 1.2 kg
Swivel hook
Reference standard: DIN 15401

D.13 LOAD ATTACHMENT

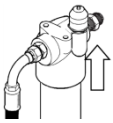
ATTACHMENT FOR HOOK AND LIFTING TOOL





D.14 HYDRAULIC SYSTEM

FITTINGS FOR CONNECTION TO PUMP

VR23NG	RDC	
Control valve pressure line		M 3/4"-16 GAS
Tank suction line		M 1" 1/2 BSP

EXTENSION TIMES OF HYDRAULIC CYLINDERS

VR23NG	Extension time s	Retraction time s
Slewing with 1 gear motor (180°)	30	30
Slewing with 2 gear motors (180°)	80	80
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 SGS active)	N\A	N\A
boom extension 3S (EES active)	N\A	N\A
boom extension 4S (SGS active)	N\A	N\A
boom extension 5S (SGS active)	N\A	N\A
boom extension 6S (SGS active)	N\A	N\A
jib articulation cylinder	N\A	N\A
jib extension 2S	N\A	N\A
jib extension 3S	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 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.

VR23NG	Time interval min.	Max. load descent mm
2S	10	415
3S	10	518
4S	10	250
5S	10	294
6S	10	340
3SJ3	10	371
4SJ3	10	402
5SJ2	10	405

CAPACITY OF HYDRAULIC SYSTEM

VR23NG	Cylinders extended ℓ	Cylinders retracted ℓ
2S	70	46
3S	78	50
4S	86	55
5S	94	60
6S	102	67
3SJ3	102	66
4SJ3	102	65
5SJ2	103	66

Capacities do not include the oil tank.

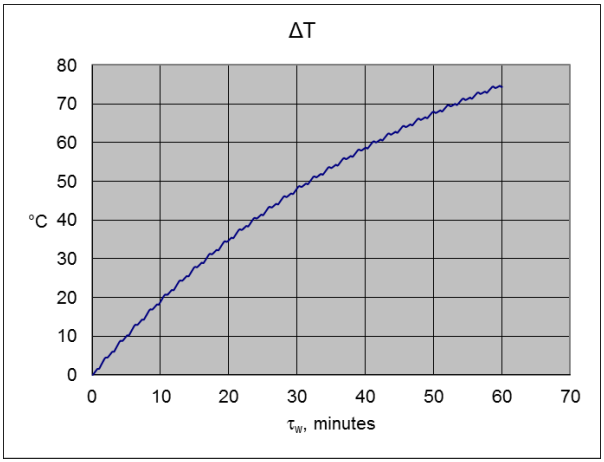
ADDITIONAL CAPACITY FOR HYDRAULICALLY OPERATED STABILIZER EXTENSIONS

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

D.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

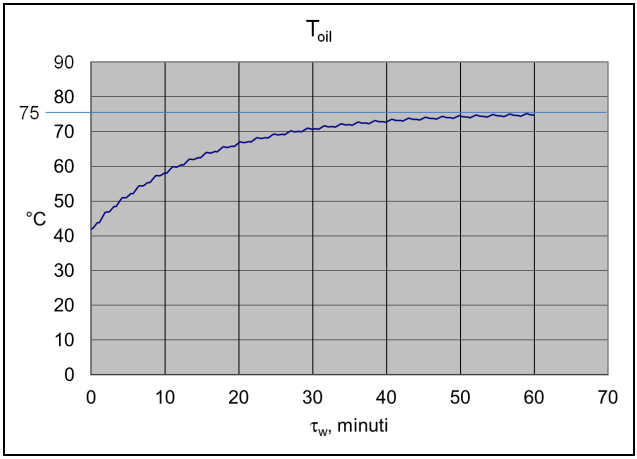
$$T_{env} + \tau_w > 57$$

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:

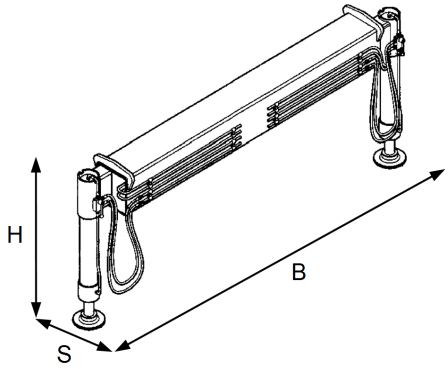
T_{env} (°C)	τ_w to exceed 75 °C (minutes)
42	no limit
45	35
48	25
50	21
52	18
54	15

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.16 ADDITIONAL STABILIZERS



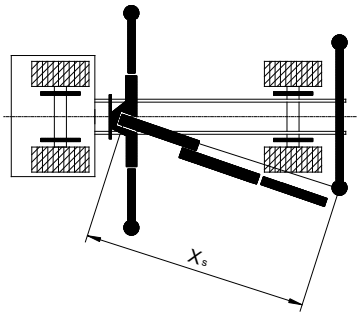
Additional stabilizers must be chosen so that:
- the installation is stable (see Installer Manual)
- the max. force acting on the additional stabilizers, F_s, is lower than the max. load allowed by the stabilizers itself, R_{max}.

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

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)
7850108	2.00	145	6250	2160x770x190
7850109	3.32	210	6250	2285x780x240
7850110	3.32	225	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	2560	H605-650	410	650	975	**2150**	54%	100%
3S	1915	H605-650	410	650	975	**1505**	72%	100%
4S	1460	H605-450	340	450	675	**1120**	70%	100%
5S	1130	H604-325	235	325	487,5	**895**	64%	100%
6S	895	H604-200	195	200	300	**700**	55%	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	2560	H653-4 large	435	500	750	**2125**	46%	100%
3S	1915	H653-4 large	435	500	750	**1480**	62%	100%
4S	1460	H653-4 large	395	350	525	**1065**	63%	100%
5S	1130	H653-4 small	250	240	360	**880**	54%	100%
6S	895	H653-4 small	235	180	270	**660**	56%	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	2560	H634-0,25	170	4000	**2390**	100%	60%
3S	1915	H634-0,25	170	4000	**1745**	100%	44%
4S	1460	H634-0,25	170	4000	**1290**	100%	32%
5S	1130	H634-0,25	170	4000	**960**	100%	24%
6S	895	H634-0,25	170	4000	**725**	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	2560	H332-850	245	2200	**2315**	96%	100%
3S	1915	H332-850	245	2200	**1670**	100%	76%
4S	1460	H332-850	245	2200	**1215**	100%	55%
5S	1130	H332-850	245	2200	**885**	100%	40%
6S	895	H332-850	245	2200	**650**	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	2560	H415 2000-500	155	2000	**2405**	84%	100%
3S	1915	H415 1500-500	135	1500	**1780**	85%	100%
4S	1460	H415 1500-500	135	1500	**1325**	100%	88%
5S	1130	H415 1500-500	135	1500	**995**	100%	66%
6S	895	H415 1500-500	135	1500	**760**	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