PRILOGA H: Tehnične lastnosti mostnega dvigala

SWF Krantechnik

Calculation number: MDE 10t x 17m	Crane work no:	User: SISIBO
Customer calc. ref.:	Printing date: 23/08/2016 (9:46 AM) Page: 1 (2)	

CRANE DATA

1   General

Crane type .... NSC10t x 17m Hol:8m
Span .... 17,00 m
Crane load (SWL) .... 10 000 kg
Number of MAIN hoists .... 1 ps

Hoist 1
    Trolley type .... Standard
    Hoist load .... 10 000 kg
    Hoisting height MAIN .... 8,0 m [max 9,0 m]
    Hoist type MAIN ND04L5DFP540AT1S
    Weight of one hoist and trolley .... 630 kg
    Hoist group MAIN .... FEM M5
    Hoisting speed .... 5/0,83 m/min   2 - speed

    Trolley traversing group .... FEM M5
    Trolley traversing speed.............................. 20 m/min   Stepless

Bridge traveling group .... FEM M5
Bridge traveling speed .... 25 m/min   Stepless

Trolley rail gauge .... N/A
Crane use .... Indoor
Crane standard EN15011
Crane use as a whole U4/Q2 EN13001-1
Average lifting range (h1+h2).............................. 4,0 + 4,0 m (D_lin4)
Average trolley travelling..................................... 8,0 m (D_lin4)
Average crane travelling .... 25,0 m (D_lin6)

Dynamic coefficient for live load........................... 1,00
Dynamic coefficient for dead load 1,00
Sideways pull factor 1,00
Crane acceleration.. 0 m/s²

Weight of crane (with hoists)................................ 5 120 kg
Weight of crane bridge (without hoists) .... 4 480 kg
Weight of one end carriage .... 260 kg
Weight of one crane traveling machinery .... 10 kg
Weight of bridge panel .... 30 kg
Weight of one main girder................................... 3 560 kg
Weight of crane service platform.......................... N/A

Main girder type .... BOX - 400/980

2   Electrical

Main voltage .... 400 V /50 Hz

Note! The maximum current of crane includes the starting current of hoisting motor(s) and nominal current of trolley and bridge traveling motors. The nominal current of crane includes the nominal current of hoisting, trolley and bridge motors. Maximum or nominal currents of crane do not include the currents of additional accessories, such as lamps, magnets etc.
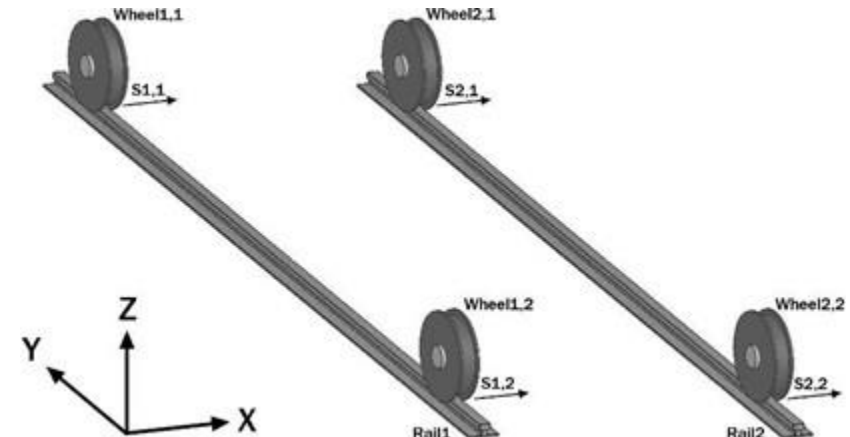
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Control voltage... 48 V
Nominal power of crane .... 10,0 kW
Main fuse size at bridge panel .... 32 A
Maximum current of crane[*] .... 89,0 A
Nominal current of crane[*] .... 25,0 A
Power factor at starting current 0
Power factor at nominal current 0

Note! The maximum current of crane includes the starting current of hoisting motor(s) and nominal current of trolley and bridge traveling motors. The nominal current of crane includes the nominal current of hoisting, trolley and bridge motors. Maximum or nominal currents of crane do not include the currents of additional accessories, such as lamps, magnets etc.

Wheel loads according to EN 1991-3 Table 2.2

Calculation number / work number	MDE 10t x 17m /
Rated capacity of crane, [kg]	10 000
Span, [m]	17,00
Wheel base, [mm]	2 500
Rail type / Wheel groove width, [mm]	50*30 / 64
Crane use as a whole	U4/Q2

Dynamic factors according to EN 13001-2

ϕ_1	1,10	For hoisting and gravity effects acting on the mass of the crane
ϕ_2	1,19	For inertial and gravity effects acting on the hoist load
ϕ_3	1,00	For sudden release of a part of the hoist load
ϕ_4	1,00	Loads caused by travelling on uneven surface
$\phi_{5,Trolley}$	1,20	For loads caused by acceleration of traversing machinery
$\phi_{5,Bridge}$	1,20	For loads caused by acceleration of travelling machinery
ϕ_6	1,10	Dynamic factor for test loads
ϕ_7	1,25	For buffer forces

Vertical wheel loads (given wheel loads are without dynamic factors and partial safety factors)

Load action / Component	Wheel1,1	Wheel1,2	Wheel2,1	Wheel2,2
Self weight of the crane (tp1), $F_{z,i,j}$	-13,3 kN	-13,5 kN	-10,4 kN	-11,1 kN
Self weight of the crane (tp2), $F_{z,i,j}$	-10,4 kN	-11,1 kN	-13,3 kN	-13,5 kN
Weight of the hoist load (tp1), $F_{z,i,j}$	-48,0 kN	-47,9 kN	-1,43 kN	-1,41 kN
Weight of the hoist load (tp2), $F_{z,i,j}$	-1,66 kN	-1,65 kN	-47,7 kN	-47,7 kN
Dynamic test load (tp1), $F_{z,i,j}$	-52,7 kN	-52,7 kN	-1,57 kN	-1,55 kN
Dynamic test load (tp2), $F_{z,i,j}$	-1,82 kN	-1,81 kN	-52,5 kN	-52,4 kN

(tp1 = Trolley position closest to Rail 1, tp2 = Trolley position closest to Rail 2)

Horizontal wheel loads (given wheel loads are without dynamic factors and partial safety factors)

Load action / Component	Wheel1,1	Wheel1,2	Wheel2,1	Wheel2,2
Acceleration of the crane bridge (tp1), $F_{x,i,j}$	-5,81 kN	5,81 kN	-1,15 kN	1,15 kN
Acceleration of the crane bridge (tp1), $F_{y,i}$	Total longitudinal force on Rail 1 = -1,53 kN		Total longitudinal force on Rail 2 = -1,53 kN	
Acceleration of the crane bridge (tp2) , $F_{x,i,j}$	1,16 kN	-1,16 kN	5,73 kN	-5,73 kN
Acceleration of the crane bridge (tp2), $F_{y,i}$	Total longitudinal force on Rail 1 = -1,53 kN		Total longitudinal force on Rail 2 = -1,53 kN	
Skewing of the crane (tp1), (Rail 1 guiding), $F_{x,i,j}$, $S_{1,2}$=12,3 kN	0 kN	-10,3 kN	0 kN	-2,08 kN
Skewing of the crane (tp2), (Rail 1 guiding), $F_{x,i,j}$, $S_{1,2}$=12,3 kN	0 kN	-2,12 kN	0 kN	-10,2 kN
Skewing of the crane (tp1), (Rail 2 guiding), $F_{x,i,j}$, $S_{2,2}$=12,3 kN	0 kN	-10,3 kN	0 kN	-2,08 kN
Skewing of the crane (tp2), (Rail 2 guiding), $F_{x,i,j}$, $S_{2,2}$=12,3 kN	0 kN	-2,12 kN	0 kN	-10,2 kN
Acceleration of trolley(s), $F_{x,i,j}$	-0,246 kN	-0,246 kN	-0,246 kN	-0,246 kN
In-service wind (tp1), $F_{y,i}$	Total longitudinal wind force on Rail 1 = 0 kN		Total longitudinal wind force on Rail 2 = 0 kN	
In-service wind (tp2), $F_{y,i}$	Total longitudinal wind force on Rail 1 = 0 kN		Total longitudinal wind force on Rail 2 = 0 kN	
Storm wind, $F_{y,i}$	Longitudinal force on storm lock 1 = 0 kN		Longitudinal force on storm lock 2 = 0 kN	
Crane collision to buffers (tp1), $F_{B,i}$	Buffer force on Rail 1 = 13,5 kN		Buffer force on Rail 2 = 10,8 kN	
Crane collision to buffers (tp2), $F_{B,i}$	Buffer force on Rail 1 = 10,9 kN		Buffer force on Rail 2 = 13,5 kN	

($F_{x,i,j}$ = Transverse force of Wheel j on Rail I, $F_{y,i}$ = Longitudinal force on Rail I, $F_{z,i,j}$ = Vertical force of Wheel j on Rail I, $S_{1,I}$ = Guiding force on Rail 1, $S_{2,I}$ = Guiding force on Rail 2)

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MAIN GIRDER DATA

1 Main girder data

Crane type ....NSC10t x 17m Hol:8m
Main girder type ....BOX – 400/980
Flange width (B__)..400 mm
Web height (H__)..980 mm
Flange flaps (F1_,F2_,F3_,F4_)...............................65,0 / 65,0 / 65,0 / 65,0 mm
Trolley rail type ....N/A
Crane service platform type ....N/A

2 Main girder (and service platform) weights

Number of main girders ....1 ps
Weight of one main girder / length unit.....................207 kg/m
Weight of one main girder ....3 560 kg
Weight of crane service platform..............................N/A

3 Main girder welding

Longitudinal welding of webs-bottom plate................Full penetration weld

4 Main girder drawing