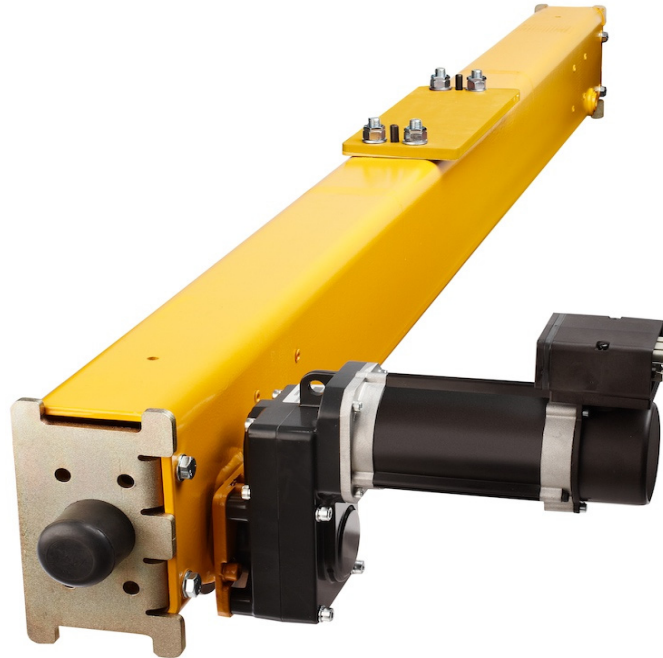


03/2011 – English



# PRODUCT DRAWINGS

## TOP RUNNING CRANE END CARRIAGE

**ETN**  
**ESN**  
**ETL**

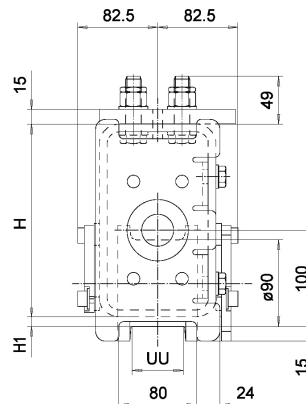
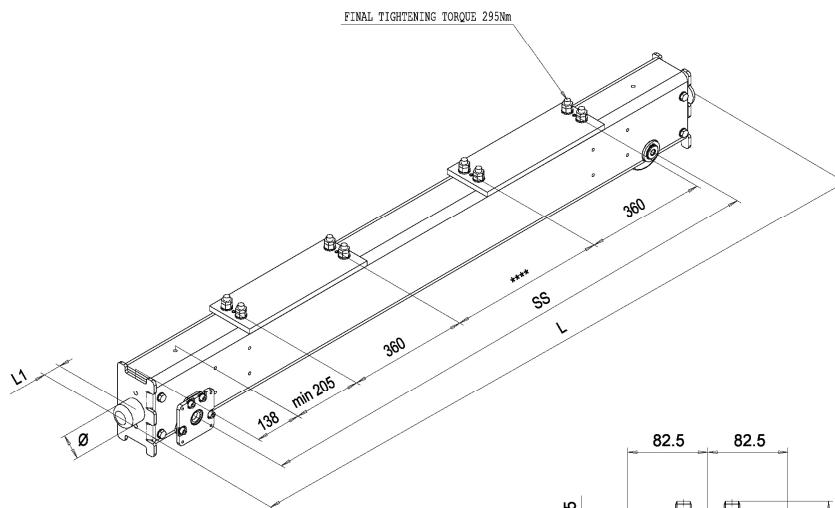
## Table of Contents

1.	ETN 09 .....	3
2.	ETN 11 .....	4
3.	ETN 14 .....	5
4.	ETN 16 .....	6
5.	ETN 20 .....	7
6.	ETN 25 .....	9
7.	ETN 32 .....	11
8.	ETN 40 .....	13
9.	ESN 09 .....	15
10.	ESN 11 .....	16
11.	ESN 14 .....	17
12.	ESN 16 .....	18
13.	ETL 09 .....	19

# 1. ETN 09

## END CARRIAGE, ETN09

For single and double girder cranes



SS (mm)	H (mm)	H1 (mm)	SG Wgt (kg)	max Pdyn (kN)	DG Wgt (kg)	max Pdyn (kN)
1250	200	10	78	28*)	-	-
1600	200	10	98	28*)	100	28*)
2000	200	10	112	28	114	28
2500	200	10	131	28	133	28

\*) 35 kN in FEM 1Am

$$L = SS + 276 + 2 * L1$$

Max. dynamic wheel load 28 kN.

Available only with ductile iron wheel.

UU=50...70

ETN09 end carriage can be equipped with 1 or 2 GES3 travelling unit

The maximum wheel load is only a guideline (calculated with double girder). The maximum value are based on assumption that the crane speed is 40m/min, the end carriage duty is Fem 2m and the runway rail width is 50mm.

If the crane speed is higher, end carriage duty group higher or used runway rail narrower the max. dynamical wheel load must be calculated separately case by case.

Buffer type	L1 (mm)	Ø (mm)
A	53	63
B	68	80
C	85	100
K	80	80
G	100	100
E	150	100
Material: A, B, C rubber K, G, E polyurethane		

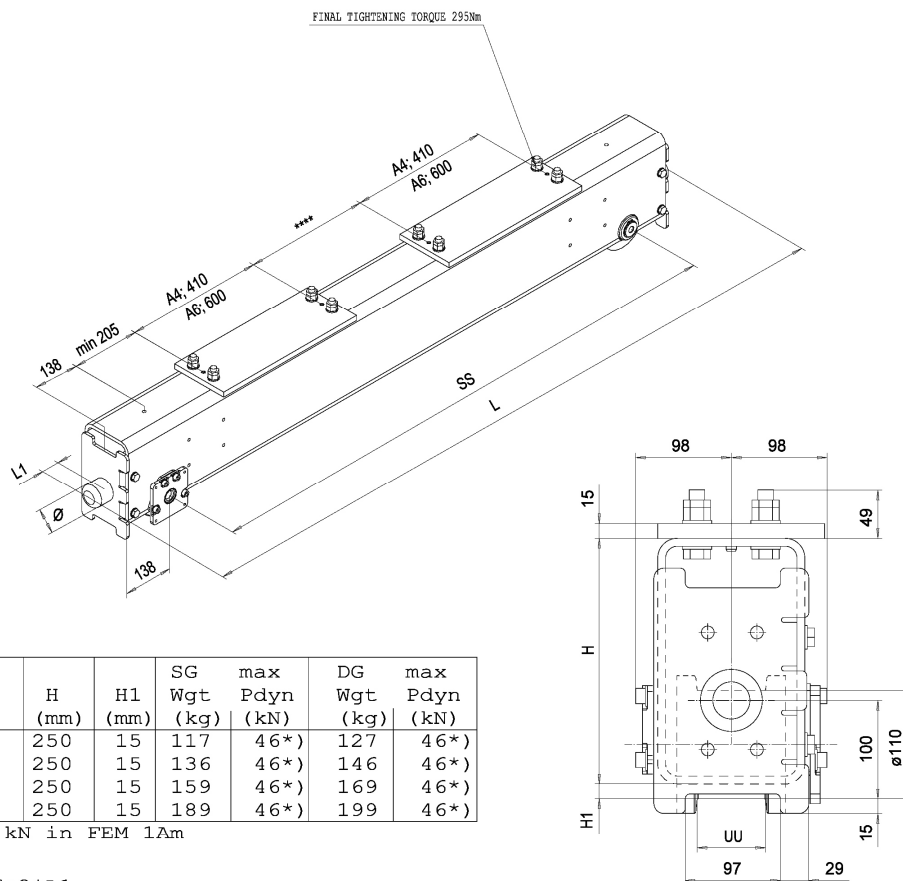
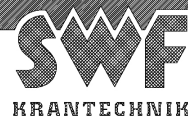
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D004778-B\_2 2007-04-18

## 2. ETN 11

### END CARRIAGE, ETN11

For single and double girder cranes



SS (mm)	H (mm)	H1 (mm)	SG Wgt (kg)	max Pdyn (kN)	DG Wgt (kg)	max Pdyn (kN)
1600	250	15	117	46*)	127	46*)
2000	250	15	136	46*)	146	46*)
2500	250	15	159	46*)	169	46*)
3150	250	15	189	46*)	199	46*)

\*) 48 kN in FEM 1Am

$$L = SS + 276 + 2 * L1$$

Max. dynamic wheel load 48 kN.

Available only with ductile iron wheel.

$$UU = 52 \dots 87$$

ETN11 end carriage can be equipped with 1 or 2 GES3 travelling unit

The maximum wheel load is only a guideline (calculated with double girder). The maximum value are based on assumption that the crane speed is 40m/min, the end carriage duty is Fem 2m and the runway rail width is 60mm.

If the crane speed is higher, end carriage duty group higher or used runway rail narrower the max. dynamical wheel load must be calculated separately case by case.

Buffer type	L1 (mm)	Ø (mm)
A	53	63
B	68	80
C	85	100
K	80	80
G	100	100
E	150	100

A, B, C rubber  
K, G, E polyurethane

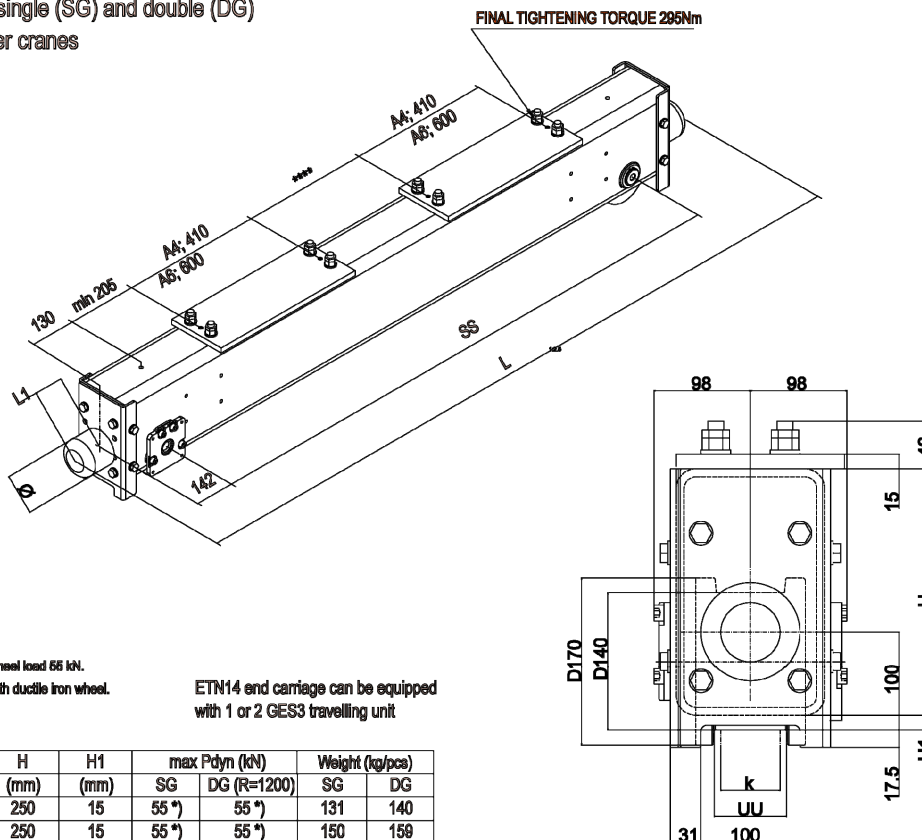
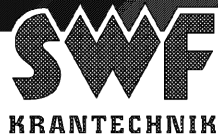
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D004918-A\_1 2007-03-29

### 3. ETN 14

#### END CARRIAGE, ETN14

For single (SG) and double (DG) girder cranes



L=SS+2B4+2\*L1

max. dynamic wheel load 66 kN.

Available only with ductile iron wheel.

UU=54...84

ETN14 end carriage can be equipped with 1 or 2 GES3 travelling unit

SS (mm)	H (mm)	H1 (mm)	max P <sub>dyn</sub> (kN)		Weight (kg/pce)	
			SG	DG (R=1200)	SG	DG
1600	250	15	55 *)	55 *)	131	140
2000	250	15	55 *)	55 *)	150	159
2500	250	15	55 *)	55 *)	173	182
3150	250	15	55 **)	55 *)	203	212
3500	250	15	48	55	220	229
4000	250	15	32	37	243	252

\*) 69 kN in FEM 1 Am

\*\*\*) 58 kN in FEM 1 Am

Weight of one end carriage (kg/pce) is calculated without buffers, when joint plate is AA and when wheel groove is UU=74.

The maximum wheel load is only a guideline (calculated with double girder). The maximum values are based on an assumption that the crane speed is 40 m/min, the duty class of the crane is 2m according to FEM and the width of the runway rail is 80mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.

Rail width k (mm)	Note!
40 ≤ k ≤ 70	With wheel grooves, U = 54...84
70 < k ≤ 100	Use flangeless wheels and guide rollers

Buffer type	L1 (mm)	Ø (mm)
A	53	63
B	68	80
C	85	100
D	105	125
K	80	80
G	100	100
E	150	100
F	190	125
M	125	125
H	160*100	160
P	240*100	160
A, B, C, D rubber		
K, G, E, F, M, H, P polyurethane		

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000888-A\_1

2010-08-08

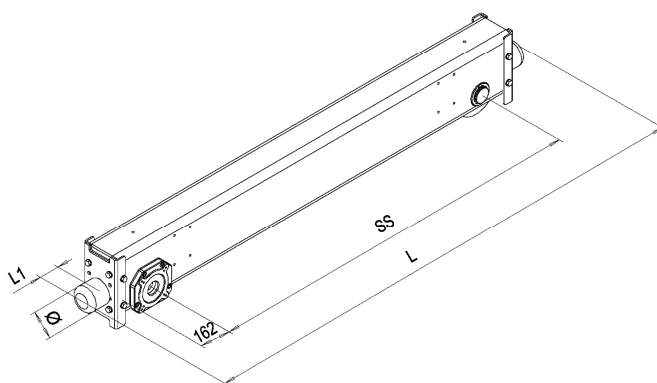
ECN14

## 4. ETN 16



### END CARRIAGE, ETN16

For single (SG) and double (DG)  
girder cranes



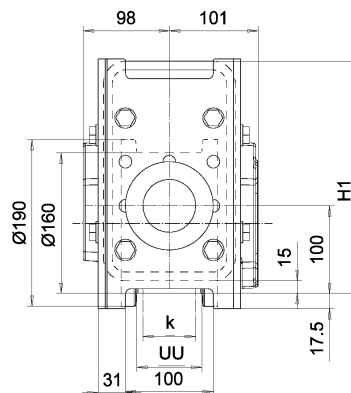
$$L = SS + 324 + 2 \cdot L1$$

max. dynamic wheel load 69 kN.  
Available only with nodular cast  
iron wheels.

ETN16 end carriage can be  
equipped with 1 or 2 GES3/GES4  
travelling unit.

SS (mm)	SG/DG	H1 (mm)	max Pdyn (kN)		Weight (kg)
			SG	DG (R=1200)	
1600	SG/DG	265	69 *)	69 *)	197
2000	SG/DG	265	69 *)	69 *)	220
2500	SG/DG	265	69 *)	69 *)	248
3150	DG	265	-	69 *)	284
3150	SG	315	69 *)	-	312
4000	SG/DG	315	63	69	368
4500	SG/DG	315	44	48	400

Buffer type	L1 (mm)	Ø (mm)
B	68	80
C	85	100
D	105	125
K	80	80
G	100	100
E	150	100
F	190	125
M	125	125
H	160+100	160
P	240+100	160
B, C, D rubber		
K, G, E, F, M, H, P polyurethane		



\*) 80.5 kN in FEM 1Am

Weight [kg] is calculated without buffers.

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 40 m/min,  
the duty class of the crane is 2m according to FEM and the width of the runway rail is 60mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the  
runway rail used is narrower, the max. dynamic wheel load shall be calculated  
separately case by case.

Rail width	Note!
k (mm)	
40 ≤ k ≤ 70	With wheel grooves, U = 54...84
70 < k ≤ 100	Use flangless wheels and guide rollers

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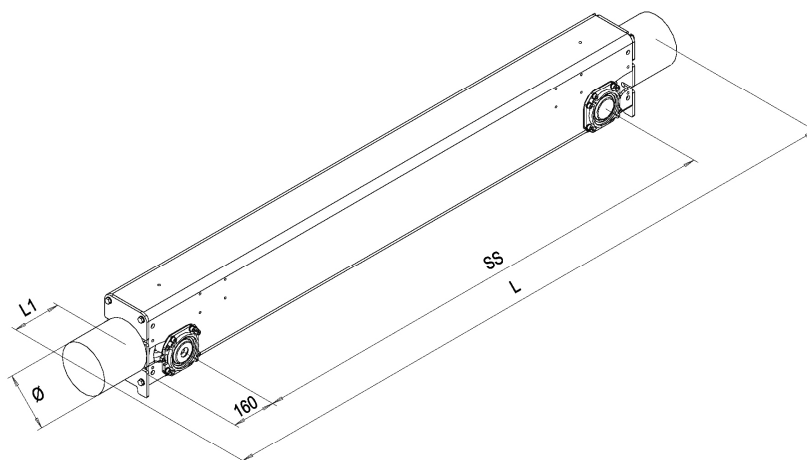
D005720-A\_1 2008-10-30 ETN16

## 5. ETN 20



### END CARRIAGE, ETN20

For single (SG) and double (DG)  
girder cranes



$$L = SS + 320 + 2 \cdot L1$$

max. dynamic wheel load 120 kN.  
Available only with nodular cast  
iron wheels.

SS (mm)	max Pdyn (kN)		Weight (kg)
	SG	DG (R=1200)	
1600	120 *)	120 *)	199
2000	120 *)	120 *)	227
2500	120 *)	120 *)	265
3150	112	120 *)	311
4000	75	85	372
4500	53	59	409

\*) 132 kN in FEM 1Am

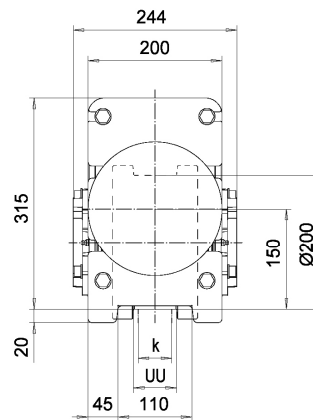
Weight [kg] is calculated with buffer type 'B'.

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 40 m/min,  
the duty class of the crane is 2m according to FEM and the width of the runway rail is 80mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the  
runway rail used is narrower, the max. dynamic wheel load shall be calculated  
separately case by case.

ETN20 end carriage can be  
equipped with 1 or 2 GES3/GES4  
travelling unit.

Buffer type	L1 (mm)	Ø (mm)
B	68	80
C	85	100
D	105	125
K	80	80
G	100	100
E	150	100
F	190	125
H	160	160
I	200	200
M	125	125
P	240	160
S	300	200
B, C, D rubber		
K, G, E, F, H, I, M, P, S polyurethane		



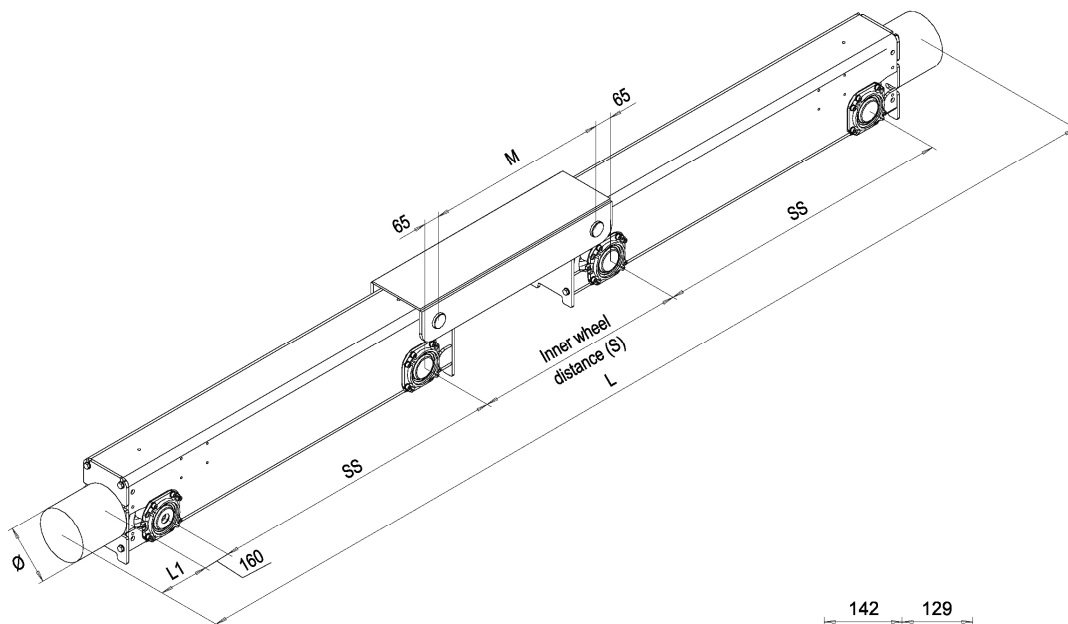
Rail width	Note!
k (mm)	
40 ≤ k ≤ 80	With wheel grooves, U = 54...94
80 < k ≤ 100	Use flangless wheels and guide rollers

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D005567-A\_1 2008-09-05 ETN20



**END CARRIAGE; BOGIE, ETN20B**

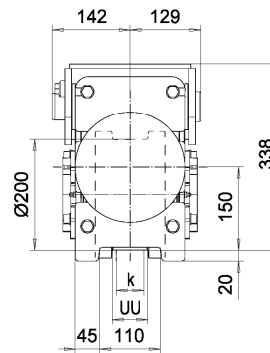


$L = 2 \cdot (SS + 160 + L1) + S$   
max. dynamic wheel load 120 kN.  
Available only with nodular cast iron wheels.

ETN20-B end carriage can be equipped with 1 or 2 GES3/GES4 travelling unit.

SS (mm)	Weight (kg)	Pdyn (kN)
1200	344	120 *)
1400	373	120 *)
1600	402	120 *)
1800	431	120 *)
2000	460	120 *)
*) 132 kN in FEM 1Am		
Total weight (kg)		
$Wgt = Weight(kg) + 43(kg/m) \cdot M(m)$		

Buffer type	L1 (mm)	Ø (mm)
B	68	80
C	65	100
D	105	125
K	80	80
G	100	100
E	150	100
F	190	125
H	160	160
I	200	200
M	125	125
P	240	160
S	300	200
B, C, D rubber		
K, G, E, F, H, I, M, P, S polyurethane		



Rail width	Note!
k (mm)	
40 ≤ k ≤ 80	With wheel grooves, U = 54...94
80 < k ≤ 100	Use flangless wheels and guide rollers

M = S-130, Mmin = 430 mm for wheel change

Weight (kg) calculated with B\_buffer type.

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 40 m/min,  
the duty class of the crane is 2m according to FEM and the width of the runway rail is 80mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.

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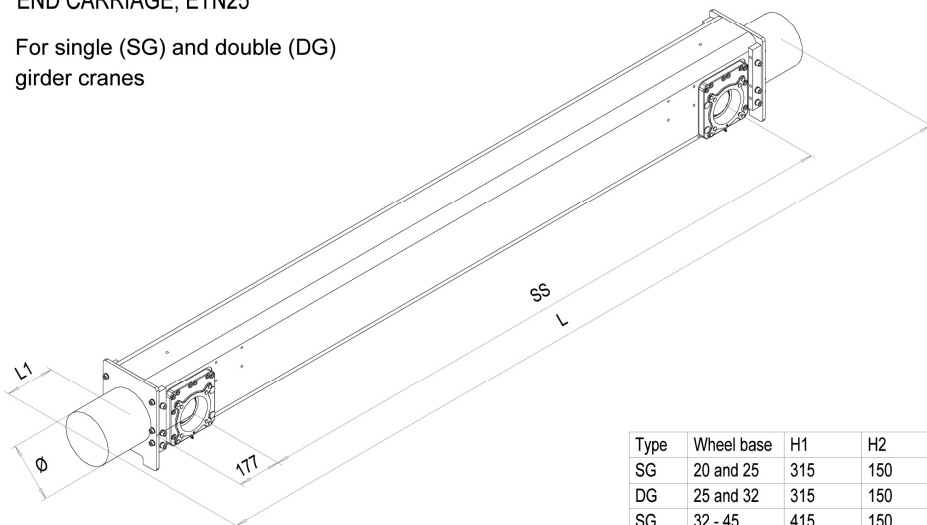
D005575-A\_1 2008-09-11 ETN20B



## 6. ETN 25

### END CARRIAGE, ETN25

For single (SG) and double (DG)  
girder cranes



Type	Wheel base	H1	H2	H
SG	20 and 25	315	150	335
DG	25 and 32	315	150	335
SG	32 - 45	415	150	435
DG	40 and 45	415	150	435
SG	50 and 55	420	155	435
DG	50 and 55	420	155	435

$$L = SS + 354 + 2 * L1$$

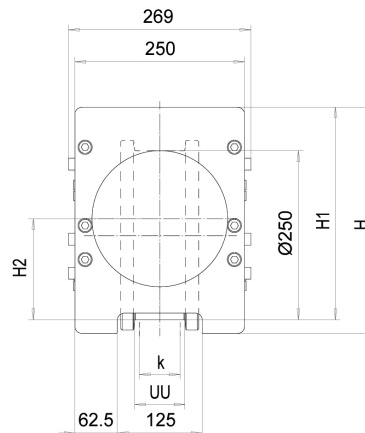
max. dynamic wheel load 185 kN.  
Available only with nodular cast  
iron wheels.

SS (mm)	max Pdyn (kN)		Weight (kg)	
	SG	DG (R=1400)	SG	DG
2000	185	-	409	-
2500	171	185	453	453
3150	170	185	579	510
4000	158	185	671	671
4500	128	139	725	725
5000	138	182	938	938
5500	125	135	1007	1007

ETN25 end carriage can be  
equipped with 1 or 2 GES4/GES5  
travelling unit.

Buffer type	L1 (mm)	Ø (mm)
B	68	80
C	85	100
D	105	125
K	80	80
G	100	100
E	150	100
F	190	125
H	160	160
I	200	200
M	125	125
P	240	160
S	300	200

B, C, D rubber  
K, G, E, F, H, I, M, P, S polyurethane



Weight [kg] is calculated with buffer type 'B'.

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 40 m/min,  
the duty class of the crane is 2m according to FEM and the width of the runway rail is 80 mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the  
runway rail used is narrower, the max. dynamic wheel load shall be calculated  
separately case by case.

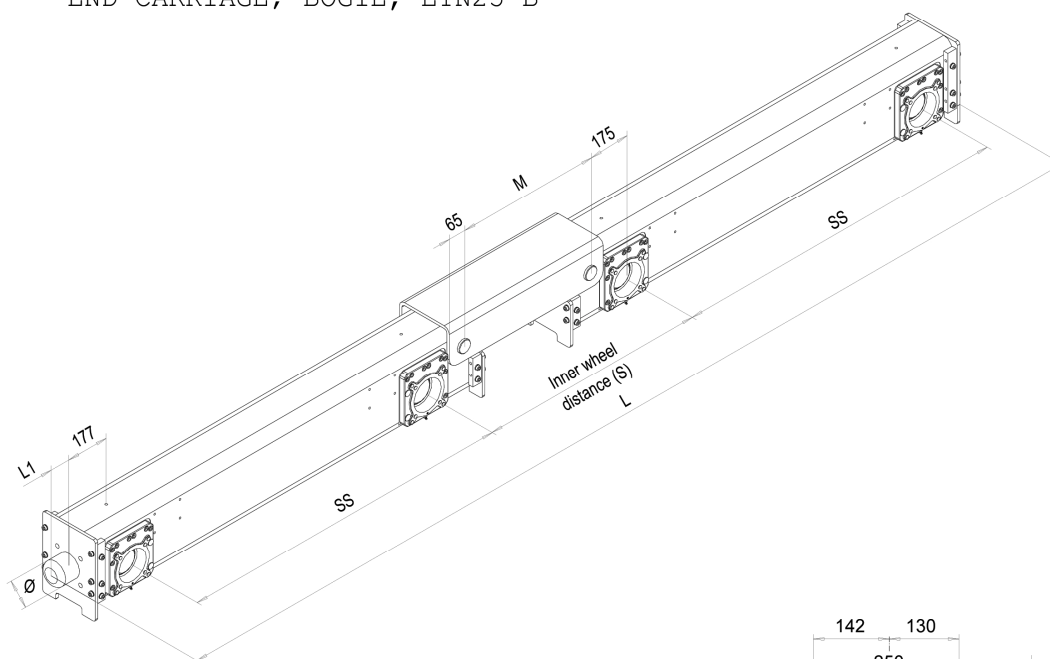
Rail width	Notel
k (mm)	
40 ≤ k ≤ 70	With wheel grooves, U = 54...84
70 < k ≤ 100	Use flangless wheels and guide rollers

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D005650-A\_3 2009-01-15 ETN25



END CARRIAGE; BOGIE, ETN25-B



$L = 2 \cdot (SS + 177 + L1) + S$   
max. dynamic wheel load 185 kN.  
Available only with nodular cast iron wheels.

SS (mm)	Weight W <sub>E</sub> (kg)	P <sub>dyn</sub> (kN)
1400	492	185
1600	528	185
1800	563	185
2000	598	185
2200	633	185
2500	686	171

Weight (W<sub>E</sub>) calculated with B<sub>1</sub> buffer type and travel wheel (UU=79), but without intermediate beam (W<sub>BB</sub>).

Total weight (Wgt) = W<sub>E</sub> + W<sub>BB</sub> (kg)

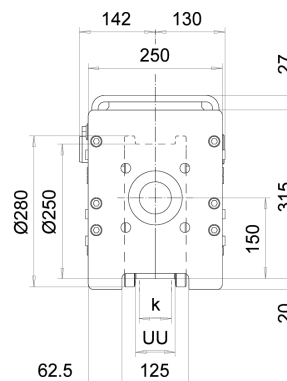
The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 40 m/min, the duty class of the crane is 2m according to FEM and the width of the runway rail is 80 mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.

ETN25 end carriage can be equipped with 1 or 2 GES4/GES5 travelling unit.

Buffer type	L1 (mm)	Ø (mm)
B	68	80
C	85	100
D	105	125
K	80	80
G	100	100
E	150	100
F	190	125
H	160	160
I	200	200
M	125	125
P	240	160
S	300	200

B, C, D rubber  
K, G, E, F, H, I, M, P, S polyurethane



Rail width	Note!
k (mm)	
40 ≤ k ≤ 70	With wheel grooves, U = 54...84
70 < k ≤ 100	Use flangless wheels and guide rollers

INTERM. BEAM	W <sub>BB</sub>
M=S-350 (mm)	(kg/pcs)
480*... < 2000	43.2 + (S-830) * 0.05
≥ 2000... < 4000	122.0 + (S-2350) * 0.05
≥ 4000... 5000	296.0 + (S-4350) * 0.07

\*) Mmin = 480 mm for wheel change

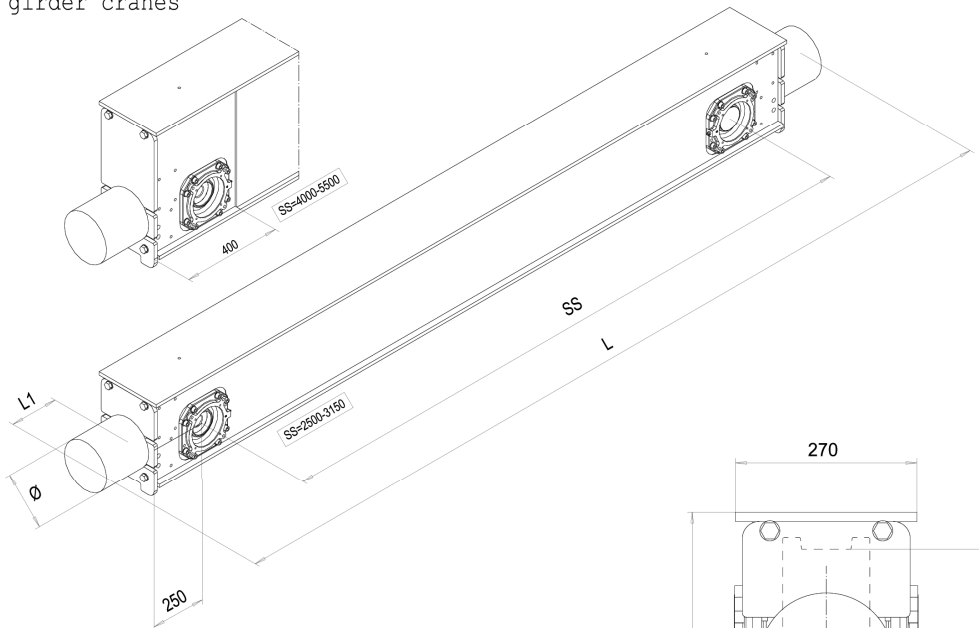
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D005892-A\_1 2009-01-14 ETN25-B

## 7. ETN 32

### END CARRIAGE, ETN32

For single and double girder cranes



$$L = SS + 500 + 2 * L1$$

max. dynamic wheel load 253 kN.

Available only with ductile castiron wheel.

SS (mm)	H1 (mm)	max Pdyn (kN)		Weight (kg)
		SG	DG (R=1400)	
2500	370	225 *)	225 *)	538
3150	370	200	225 *)	623
4000	470	208	225 *)	716
4500	470	185	225 **)	772
5000	545	200	225 *)	895
5500	545	182	225	956

\*) 253 kN in FEM 1Am; \*\*) 243 kN in FEM 1Am

Weight [kg] is calculated with buffer type 'B', but without inner support plates of the end carriage.

The maximum wheel load is only a guideline (calculated with double girder).

The maximum values are based on an assumption that the crane speed is 40 m/min, the duty class of the crane is 2m according to FEM and the width of the runway rail is 80mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.

ETN32 end carriage can be equipped with 1 or 2 GES4/GES5 travelling unit.

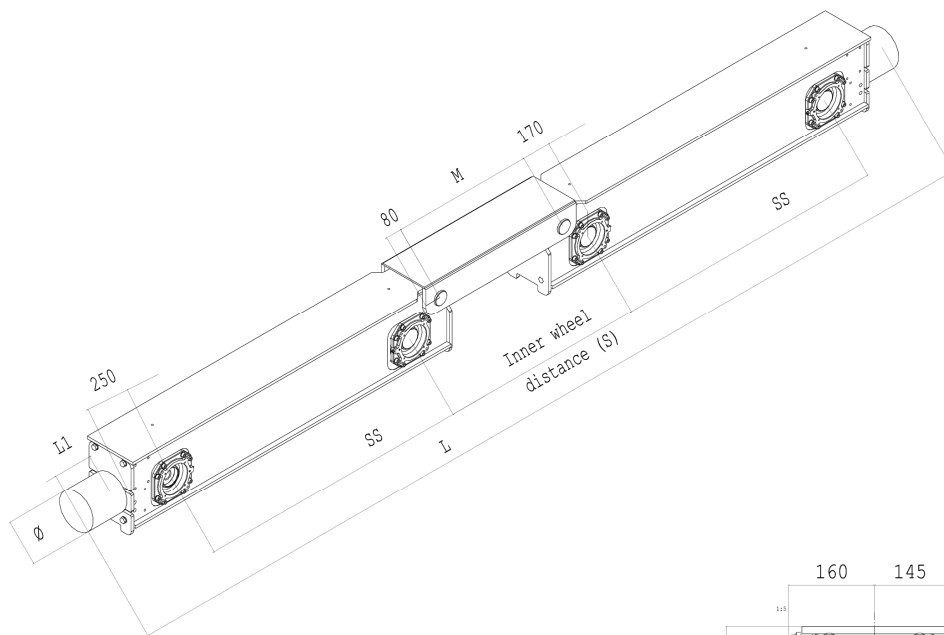
Buffer type	L1 (mm)	Ø (mm)
B	68	80
C	85	100
D	105	125
E	150	100
F	190	125
H	160	160
I	200	200
M	125	125
P	240	160
S	300	200
T	350	250
Y	475	250
B, C, D rubber		
E, F, H, I, M, P, S, T, Y polyurethane		

Rail width	Note!
k (mm)	
50..80	Ductile cast iron wheel (UU=64...94)
>80 ≤100	Use flangeless wheels and guide rollers

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D005089-A\_1 2007-09-10 ETN32

END CARRIAGE; BOGIE, ETN32-B



$L = 2 * (SS + 250 + L1) + S$   
max. dynamic wheel load 253 kN.  
Available only with ductile castiron wheel.

ETN32-B end carriage can be equipped with 1 or 2 GES4/GES5 travelling unit.

SS (mm)	Weight (kg)	Pdyn (kN)
1400	395	225 *)
1600	421	225 *)
1800	447	225 *)
2000	473	225 *)

\*) 253 kN in FEM 1Am

Total weight (kg)

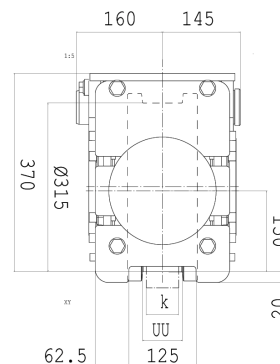
$Wgt = Weight * 2 (kg) + 16 (kg) + 64 (kg/m) * M (m)$

Buffer type	a (mm)	Ø (mm)
B	68	80
C	85	100
D	105	125
E	150	100
F	190	125
H	160	160
I	200	200
M	125	125
P	240	160
S	300	200
T	350	250
Y	475	250
B, C, D rubber		
E, F, H, I, M, P, S, T, Y polyurethane		

Weight (kg) calculated with B\_buffer type, but without inner support plates of end carriage.

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 40 m/min,  
the duty class of the crane is 2m according to FEM and the width of the runway rail is 80mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.



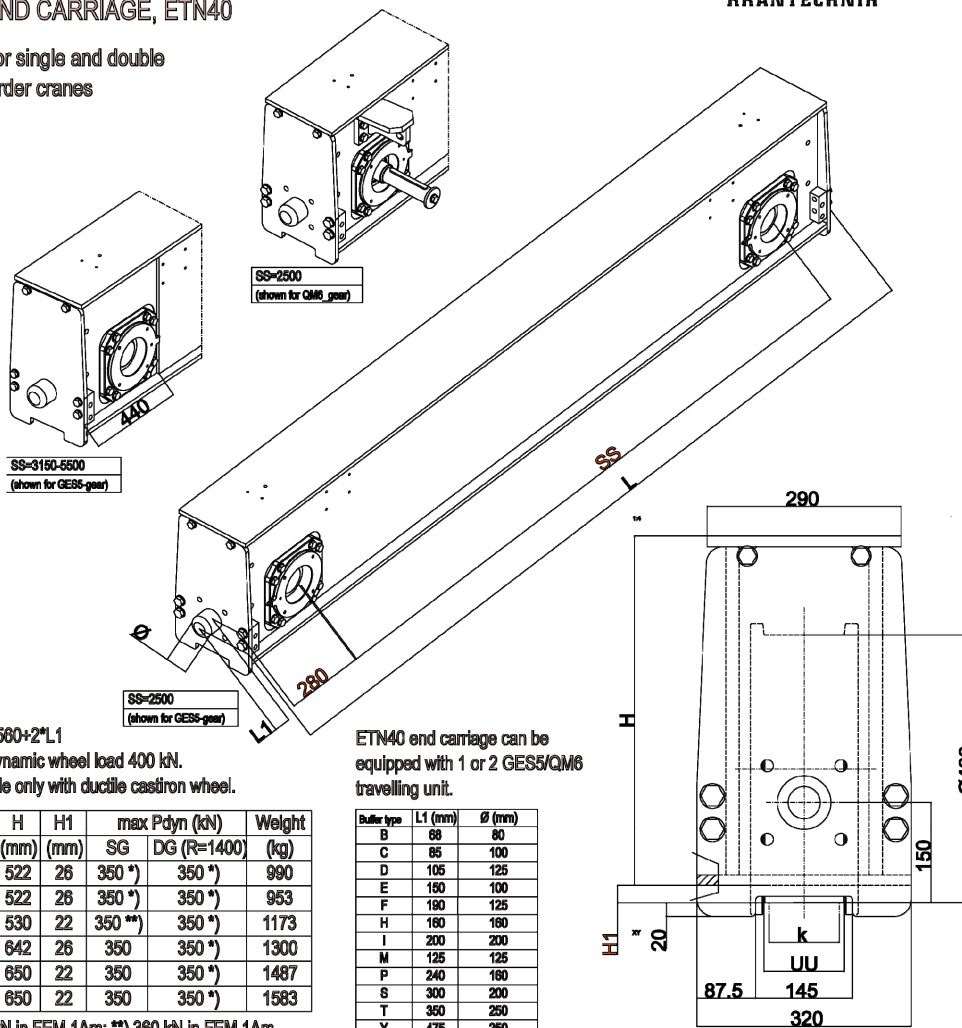
Rail width	Note!
k (mm)	
50...80	Ductile cast iron wheel (UU=64...94)
>80	Use flangeless wheels and guide rollers

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## 8. ETN40

### END CARRIAGE, ETN40

For single and double girder cranes



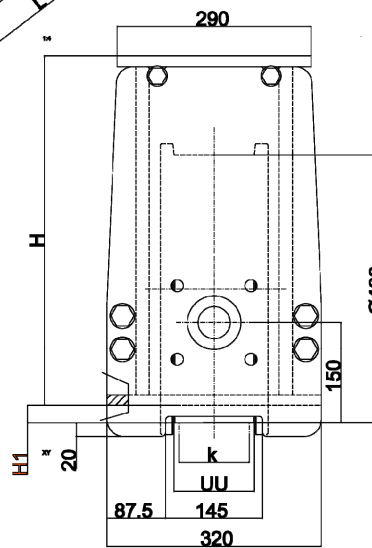
$L = SS + 560 + 2 \cdot L1$   
max. dynamic wheel load 400 kN.  
Available only with ductile cast iron wheel.

ETN40 end carriage can be equipped with 1 or 2 GES5/QM6 travelling unit.

SS (mm)	H (mm)	H1 (mm)	max P <sub>dyn</sub> (kN)		Weight (kg)
			SG	DG (R=1400)	
2500	522	26	350 *)	350 *)	990
3150	522	26	350 *)	350 *)	953
4000	530	22	350 **)	350 *)	1173
4500	642	26	350	350 *)	1300
5000	650	22	350	350 *)	1487
5500	650	22	350	350 *)	1583

\*) 400 kN in FEM 1Am; \*\*) 360 kN in FEM 1Am

Buffer type	L1 (mm)	Ø (mm)
B	88	80
C	85	100
D	105	125
E	150	100
F	180	125
H	180	180
I	200	200
M	125	125
P	240	180
S	300	200
T	360	250
Y	475	250
B, C, D rubber		
E, F, H, L, M, P, R, T, Y polyurethane		



Weight [kg] is calculated with buffer type 'B', but without inner support plates of the end carriage  
Extra weight (33 kg/gear), when QM6-gear is used.

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 32 m/min, the duty class of the crane is 2m according to FEM and the width of the runway rail is 100 mm.

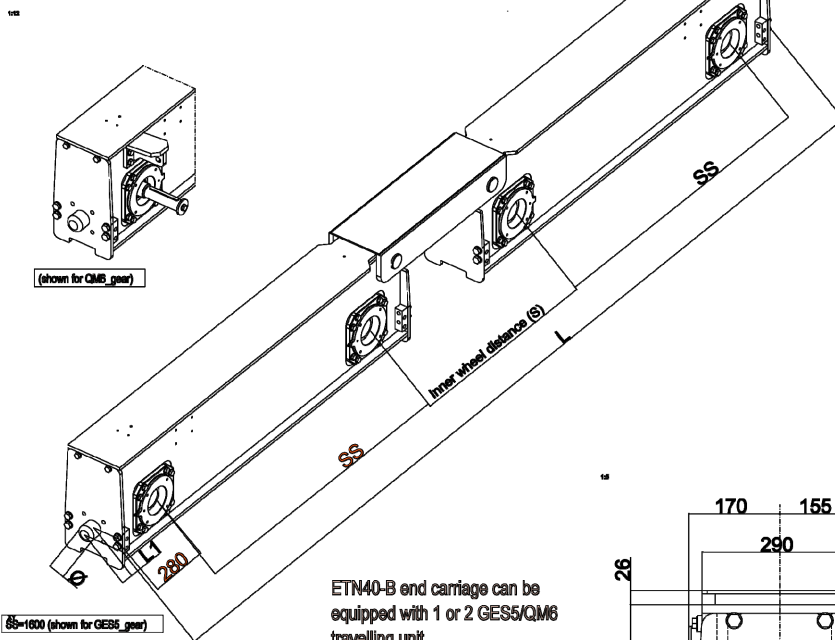
If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.

Rail width	Notes
k (mm)	
40...105	Ductile cast iron wheel (UU=55...120)
>105 ≤120	Use flangeless wheels and guide rollers

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D008915-A\_1 2010-10-01 ECR40

**END CARRIAGE, ETN40-B**

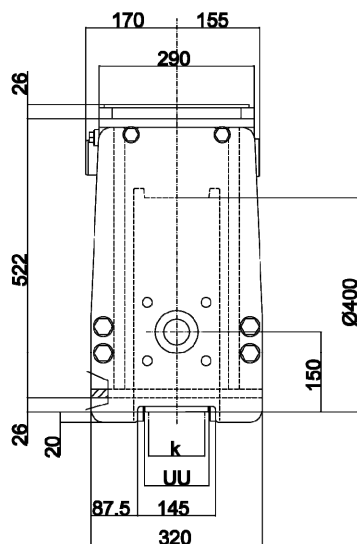


ETN40-B end carriage can be equipped with 1 or 2 GESS/QM6 travelling unit.

$L = 2 \cdot (SS + 280 + L1) + S$   
 $S_{min} = 1000 \text{ mm}$  for wheel change  
 max. dynamic wheel load 400 kN.  
 Available only with ductile cast iron wheel.

SS (mm)	Weight (kg)	Pdyn (kN)
1600	642	350 *
1800	688	350 *
2000	735	350 *
2200	781	350 *
2500	850	350 *
*) 400 kN in FEM 1Am		
Total weight (kg)		
Wgt = Weight*2(kg)+53(kg)+0.081kg/mm*M(mm)		

Buffer type	L1 (mm)	Ø (mm)
B	68	80
C	85	100
D	105	125
E	150	100
F	190	125
H	160	160
I	200	200
M	125	125
P	240	160
S	300	200
T	350	250
Y	475	250
B, C, D rubber		
E, F, H, I, M, P, S, T, Y polyurethane		



Weight [kg] is calculated with buffer type 'B', but without inner support plates of the end carriage  
 Extra weight (33 kg/gear), when QM6-gear is used.  
 The maximum wheel load is only a guideline (calculated with double glider).  
 The maximum values are based on an assumption that the crane speed is 32 m/min, the duty class of the crane is 2m according to FEM and the width of the runway rail is 100 mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.

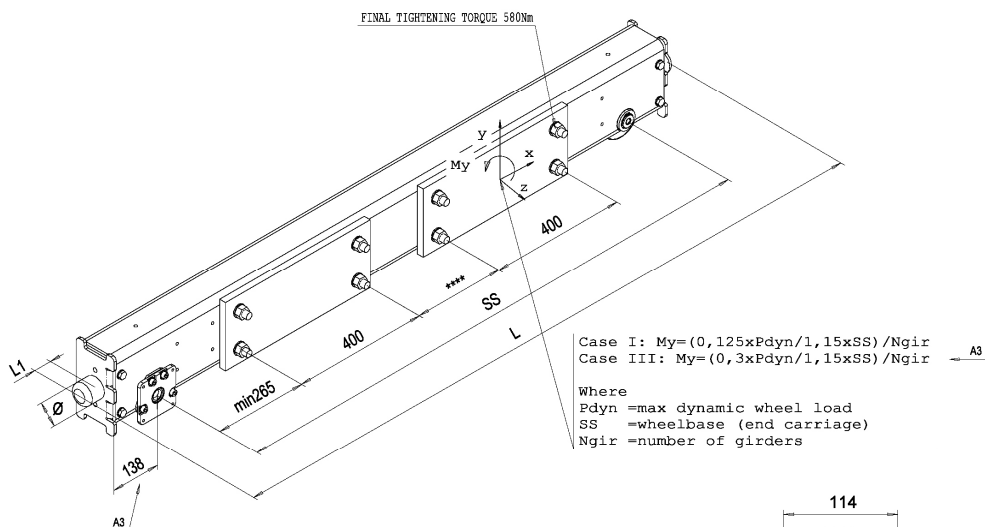
Rail width	Notes
k (mm)	
40...105	Ductile cast iron wheel (JU=55...120)
>105 ≤120	Use flangeless wheels and guide rollers

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## 9. ESN 09

### END CARRIAGE, ESN09

For single and double  
girder cranes



Case I:  $M_y = (0,125 \times P_{dyn} / l, 15 \times SS) / N_{gir}$   
 Case III:  $M_y = (0,3 \times P_{dyn} / l, 15 \times SS) / N_{gir}$  → A3  
 Where  
 $P_{dyn}$  = max dynamic wheel load  
 $SS$  = wheelbase (end carriage)  
 $N_{gir}$  = number of girders

SS (mm)	H (mm)	H1 (mm)	SG Wgt (kg)	max P <sub>dyn</sub> (kN)	DG Wgt (kg)	max P <sub>dyn</sub> (kN)
1250	205	10	86	28*)	-	-
1600	205	10	99	28*)	116	28*)
2000	205	10	113	28	130	28
2500	205	10	132	28	149	28

\*) 35 kN in FEM 1Am

$$L = SS + 276 + 2 \times L1$$

$$\text{Max } M_y(\text{I}) = 9 \text{ kNm}, M_y(\text{III}) = 21.6 \text{ kNm}$$

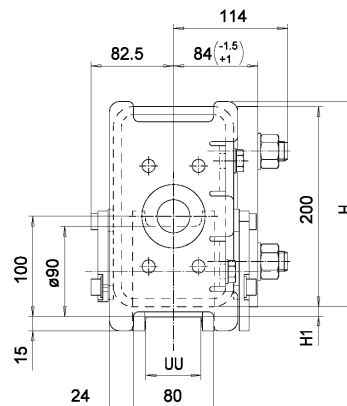
Available only with ductile iron wheel.

$$UU = 50 \dots 70$$

ESN09 end carriage can be equipped  
with 1 or 2 GES3 travelling unit

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum value are based on assumption that the crane speed is 40m/min,  
the end carriage duty is Fem 2m and the runway rail width is 50mm.

If the crane speed is higher, end carriage duty group higher or used  
runway rail narrower the max. dynamical wheel load must be calculated  
separately case by case.



Buffer type	L1 (mm)	Ø (mm)
A	53	63
B	68	80
C	85	100
K	80	80
G	100	100
E	150	100

Material: A,B,C rubber  
K,G,E polyurethane

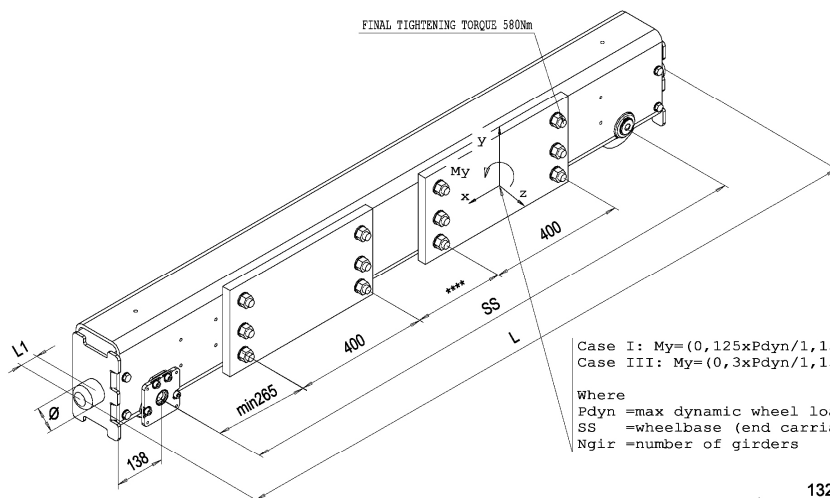
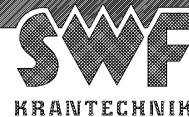
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D004769-A\_4 2007-11-28 ESN09

## 10. ESN 11

### END CARRIAGE, ESN11

For single and double girder cranes

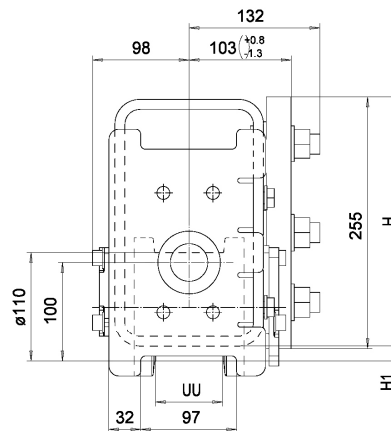


Case I:  $M_y = (0,125 \times P_{dyn} / l, 15 \times SS) / N_{gir}$   
 Case III:  $M_y = (0,3 \times P_{dyn} / l, 15 \times SS) / N_{gir}$

Where  
 $P_{dyn}$  = max dynamic wheel load  
 SS = wheelbase (end carriage)  
 $N_{gir}$  = number of girders

SS (mm)	H (mm)	H1 (mm)	SG Wgt (kg)	max Pdyn (kN)	DG Wgt (kg)	max Pdyn (kN)
1600	253	15	153	46*	179	46*
2000	253	15	176	46*	202	46*
2500	253	15	204	46*	230	46*
3150	253	15	241	46*	267	46*

\*) 48kN in FEM 1Am



$$L = SS + 276 + 2 \times L1$$

Max  $M_y(I) = 19$  kNm,  $M_y(III) = 45.7$  kNm

Available only with ductile iron wheel.

UU=52...87

ESN11 end carriage can be equipped with 1 or 2 GES3 travelling unit

The maximum wheel load is only a guideline (calculated with double girder). The maximum value are based on assumption that the crane speed is 40m/min, the end carriage duty is Fem 2m and the runway rail width is 60mm.

If the crane speed is higher, end carriage duty group higher or used runway rail narrower the max. dynamical wheel load must be calculated separately case by case.

Buffer type	L1 (mm)	Ø (mm)
A	53	63
B	68	80
C	85	100
K	80	80
G	100	100
E	150	100

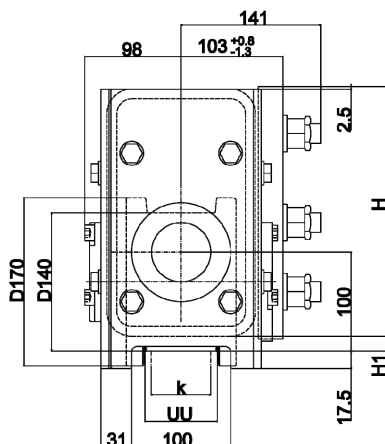
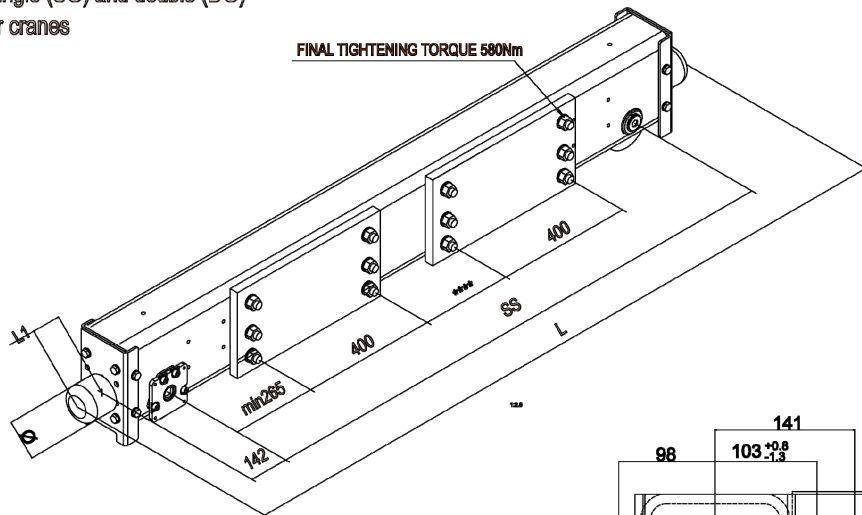
A, B, C rubber  
 K, G, E polyurethane



# 11. ESN 14

## END CARRIAGE, ESN14

For single (SG) and double (DG) girder cranes



$L = SS + 284 + 2 \cdot L1$

Max. dynamic wheel load 89 kN.  
Available only with ductile iron wheel.  
UU=54...84

ESN14 end carriage can be equipped with 1 or 2 GES3/GES4 travelling unit.

SS (mm)	H (mm)	H1 (mm)	max P <sub>dyn</sub> (kN)		Weight (kg/pcs)	
			SG	DG (R=1200)	SG	DG
1600	253	15	47 *)	55 **)	165	910
2000	253	15	47 *)	55 **)	188	213
2500	253	15	47 *)	55 **)	216	241
3150	253	15	47	55 **)	253	278
3500	253	15	40	55	273	298
4000	253	15	32	37	303	328

\*) 52 kN in FEM 1 Am  
\*\*) 69 kN in FEM 1 Am

Weight of one end carriage (kg/pcs) is calculated without buffers, when wheel groove is UU=74.

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 40 m/min, the duty class of the crane is 2m according to FEM and the width of the runway rail is 80mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.

Rail width	Notes
k (mm)	
40 ≤ k ≤ 70	With wheel grooves, U = 54...84
70 < k ≤ 100	Use flangeless wheels and guide rollers

Buffer type	L1 (mm)	Ø (mm)
A	53	63
B	68	80
C	85	100
D	105	125
K	80	80
G	100	100
E	150	100
F	190	125
M	125	125
H	180+100	160
P	240+100	160
	A, B, C, D rubber	
	K, G, E, F, M, H, P polyurethane	

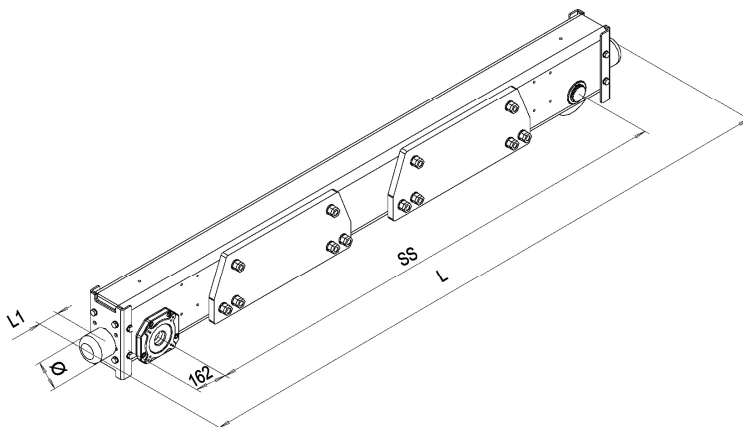
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## 12. ESN 16



### END CARRIAGE, ESN16

For single (SG) and double (DG) girder cranes



$L=SS+324+2*L1$

Max. dynamic wheel load 69 kN.  
Available only with nodular cast iron wheels.

ESN16 end carriage can be equipped with 1 or 2 GES3/GES4 travelling unit.

SS (mm)	SG/DG	H1 (mm)	max Pdyn (kN)		Weight (kg)
			SG	DG (R=1200)	
1600	SG/DG	265	69 *)	69 *)	197
2000	SG/DG	265	69 *)	69 *)	220
2500	SG/DG	265	69 *)	69 *)	248
3150	DG	265	-	69 *)	284
3150	SG	315	69 *)	-	312
4000	SG/DG	315	63	69	368
4500	SG/DG	315	44	48	400

\*) 80.5 kN in FEM 1Am

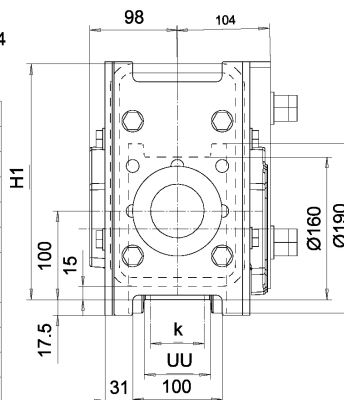
Weight [kg] is calculated without buffers and joint plate.

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum values are based on an assumption that the crane speed is 40 m/min,  
the duty class of the crane is 2m according to FEM and the width of the runway rail is 60mm.

If the speed of the crane is higher, the duty class of the end truck is higher or the runway rail used is narrower, the max. dynamic wheel load shall be calculated separately case by case.

Buffer type	L1 (mm)	Ø (mm)
B	68	80
C	85	100
D	105	125
K	80	80
G	100	100
E	150	100
F	190	125
M	125	125
H	160+100	160
P	240+100	160

B, C, D rubber  
K, G, E, F, M, H, P polyurethane



Rail width	Note!
k (mm)	
40 ≤ k ≤ 70	With wheel grooves, U = 54...84
70 < k ≤ 100	Use flangless wheels and guide rollers

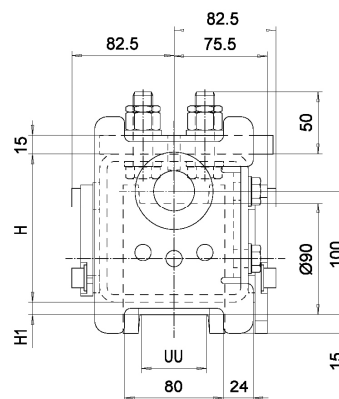
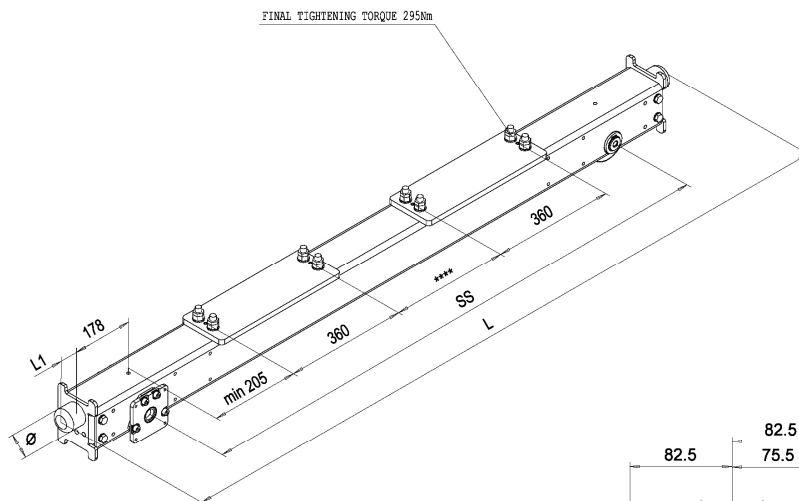
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D005724-A\_1 2008-10-31 ESN16

### 13. ETL 09

#### END CARRIAGE, ETL09

For single and double  
girder cranes



SS (mm)	H (mm)	H1 (mm)	SG Wgt (kg)	max Pdyn (kN)	DG Wgt (kg)	max Pdyn (kN)
1250	120	10	53	28	-	-
1600	120	10	60	23	67	28
2000	120	10	69	18	75	28

$$L = SS + 276 + 2 * L1$$

Max. dynamic wheel load 28 kN.

Available only with ductile iron wheel.

UU=50...70

ETL09 end carriage can be equipped  
with 1 or 2 GES3 travelling unit

The maximum wheel load is only a guideline (calculated with double girder).  
The maximum value are based on assumption that the crane speed is 40m/min,  
the end carriage duty is Fem 2m and the runway rail width is 50mm.

If the crane speed is higher, end carriage duty group higher or used  
runway rail narrower the max. dynamical wheel load must be calculated  
separately case by case.

Buffer type	L1 (mm)	Ø (mm)
A	53	63
B	68	80
C	85	100
K	80	80
G	100	100
E	150	100

Material: A,B,C rubber  
K,G,E polyurethane

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D005064-B\_1 2008-02-04 ETL09