



# ZÖLLNER

SIGNAL SYSTEM TECHNOLOGIES

## Elephant Ears - Elephant Sound

# ZET-HORN 70AC



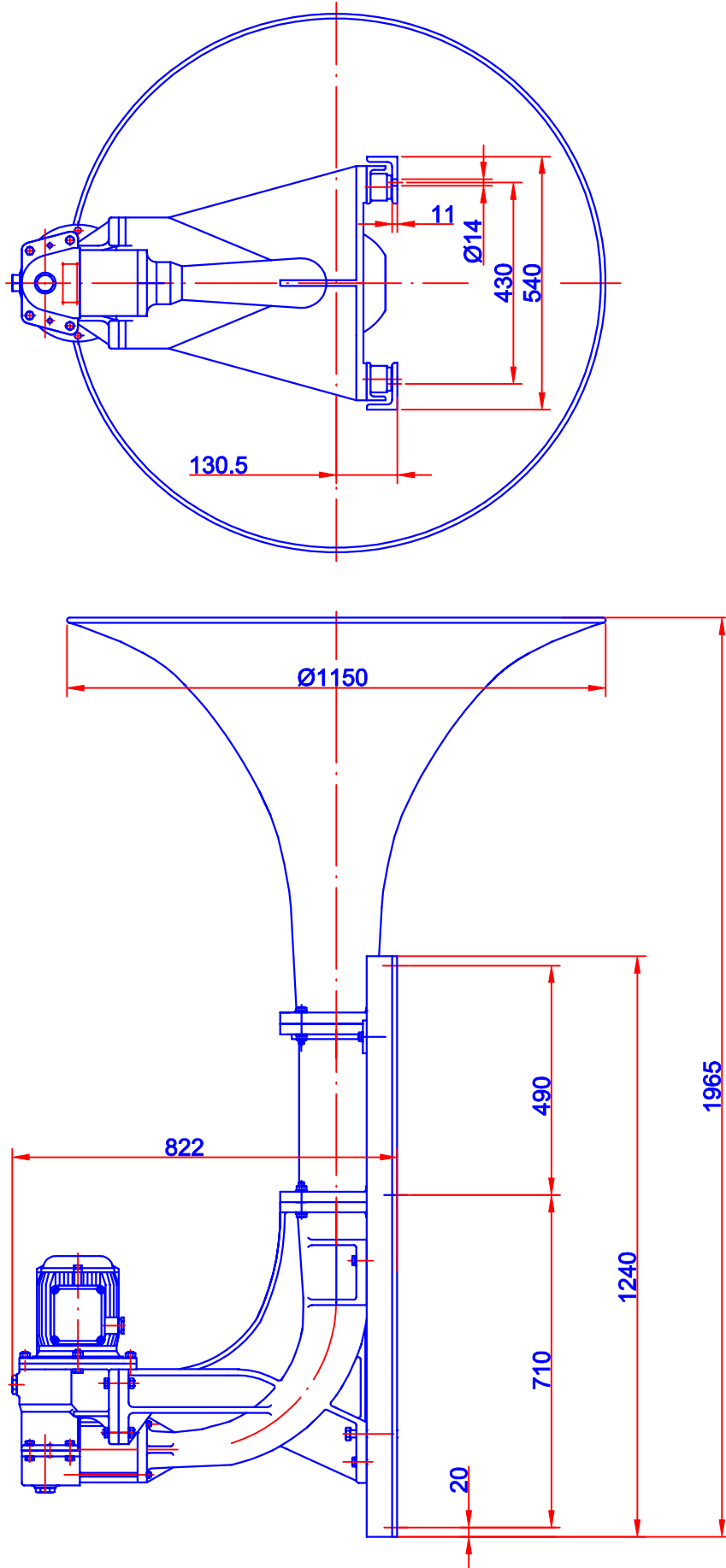
## A powerful sound for powerful ships

Frequency: 70Hz  
1/3 octave band level at 1m: 143dB(A)  
For class I ships (length: 200m or more)  
Reliable and modern construction

**ZÖLLNER**  
SIGNAL SYSTEM TECHNOLOGIES  
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E-mail: [signal@zoellner.de](mailto:signal@zoellner.de)  
[www.zoellner.de](http://www.zoellner.de)

Subject to alteration! 09/02

SW 106e



TYP	CURRENT FREQUENCY	BASIC FREQUENCY	SOUND INTENSITY AT 1 M DISTANCE dB(A)	MOTOR OUTPUT	MOTOR HEATING up to	WEIGHT	TYP TEST BSH-NO (DHI)
70AC	50HZ 60HZ	70Hz	146 143	5,5KW	250W	105KG	BSH/6375/003/00

## ZET-Horn 90/110 AC

### General Features

The ZÖLLNER ZET-Horn was the first piston type whistle on the world market driven by an AC 3phase motor. An essential component is the piston inside the cylinder driven by an AC 3phase motor via connecting rod, crankshaft and gearwheels. The piston oscillates at a certain frequency which makes the air inside the sound projector vibrate in resonance to produce a clean sound audibel over a wide range.



### Essentials

- full compliance with the Colregs 1972, Annex III
- type approved by all wellknown international authorities and classification societies
- application:
  - vessels of class I, 200 m ore more in length
  - land alarm, i.e. bunker stations, oil refineries, airports, power plants, factories
- system voltage: AC 3phase/control box AC 1ph.
- entirely made of best non-corrosion, seawater-resistant materials
  - gearwheels made of wear-resistant upgraded steel (no plastic!)

### Sound Characteristics

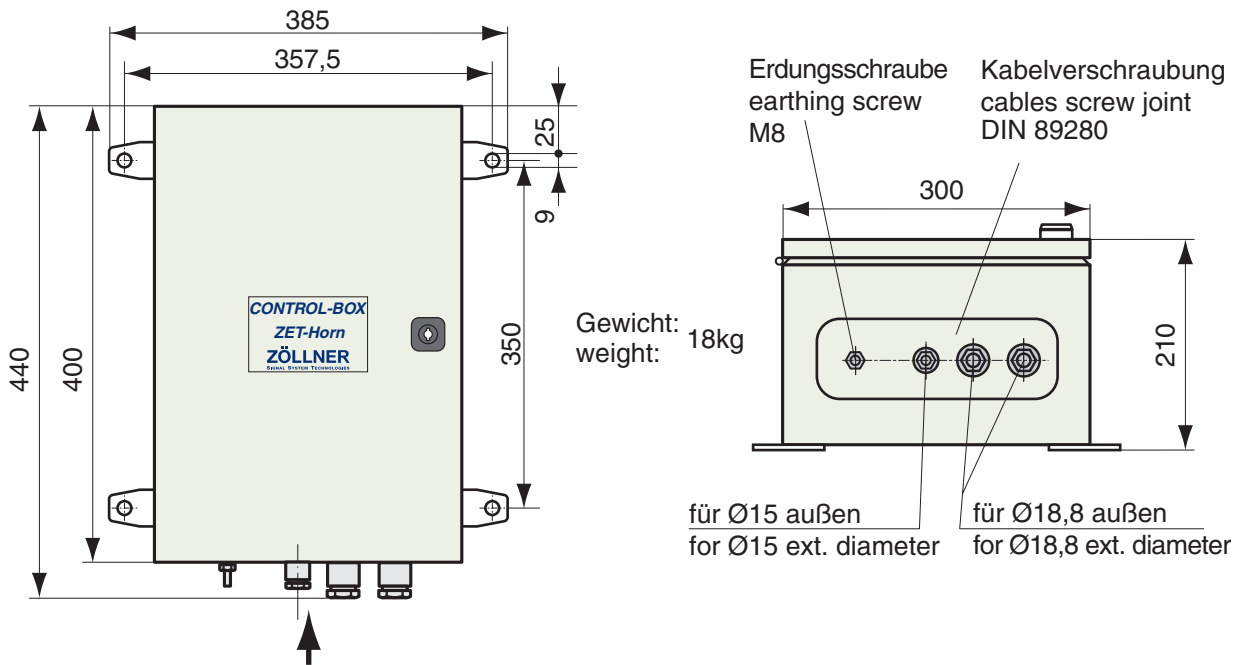
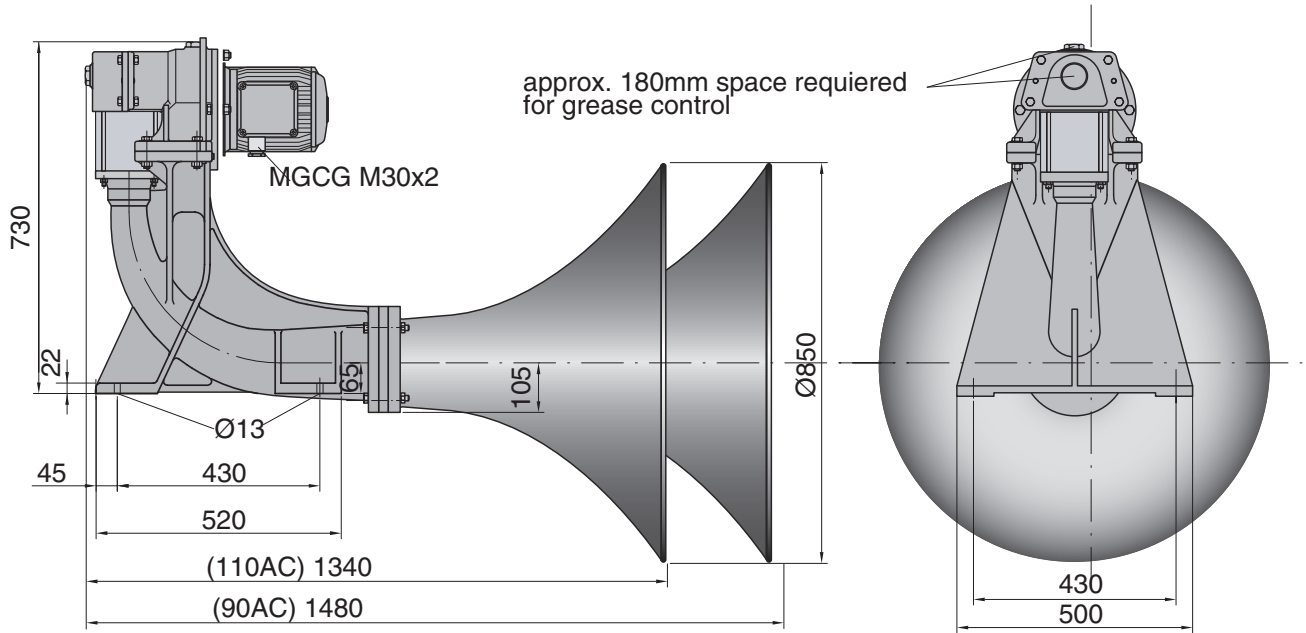
- broad frequency spectrum with many higher harmonics
- signals with strong overtones for best penetration of background noise level
  - Even when a background noise covers the actual basic frequency the residual tone forms a parent frequency in the human hearing. Two or three harmonics are sufficient for the hearing to perceive the basic frequency.*
- sound frequency of 90 Hz / 110 Hz very advantageously ranks in the lower admissable range (70-200 Hz)
- sound pressure level 143 dB in 1/3rd octave band at 1 m distance

### Advantages

- decades of experience
- best material and workmanship - made in Germany
- entirely made of best non-corrosion, seawater-resistant materials
- simple but matured design
  - easy exchange of all parts with onboard tools
  - steady lubrication with standard grease (no oil!)
- cylinder suspended vertically for optimum discharge of spray, flood, condensation water or melted snow
- motor heating to avoid condensed water in cluded as a standard,
  - no additional cable required!
- easy installation
  - only one three-core cable required for connection to board mains!
  - relatively low weight
  - not affected by voltage and frequency fluctuations of board mains

# Positioning and installation

- Positioning as high as practicable on the vessel to reduce interception of the emitted sound by obstructions and to avoid hearing damage risk to the personnel.
- The sound pressure level of a vessel's own signal at listening posts must not exceed 110 dB(A).

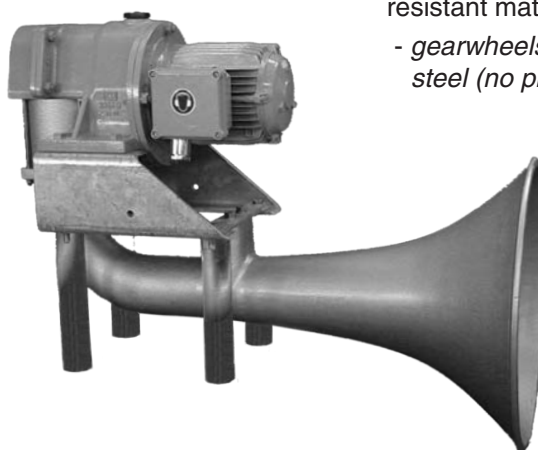


type	ship length [m]	current frequency		fundamental frequency [Hz]	sound intensity in 1/3rd-octave band level at 1 m distance		motor output [kW]	motor heating up to [W]	type approval BSH(DHI) no.	protection type	weight [W]
		50Hz	60Hz		dB(A)	min. IMO 1/3rd oct					
90AC	>200	../5	../6	90	146	143 dB	5,5	250	49/02P/01/78	IP 56	92
110AC	>200	../5	../6	110	143	143 dB	5,5	250	49/02P/02/95	IP 56	90

## ZET-Horn 131/141 AC

### General Features

The ZÖLLNER ZET-Horn was the first piston type whistle on the world market driven by an AC 3phase motor. An essential component is the piston inside the cylinder driven by an AC 3phase motor via connecting rod, crankshaft and gearwheels. The piston oscillates at a certain frequency which makes the air inside the sound projector vibrate in resonance to produce a clean sound audibel over a wide range.



### Essentials

- full compliance with the Colregs 1972, Annex III
- type approved by all wellknown international authorities and classification societies
- application:
  - vessels of class II, 75 m but less than 200 m in length
  - special design for arctic class available
  - special military design available
  - land alarm, i.e. bunker stations, oil refineries, airports, power plants, factories
- system voltage: AC 3phase/control box AC 1ph.
- entirely made of best non-corrosion, seawater-resistant materials
  - gearwheels made of wear-resistant upgraded steel (no plastic!)

### Sound Characteristics

- broad frequency spectrum with many higher harmonics
- signals with strong overtones for best penetration of background noise level
 

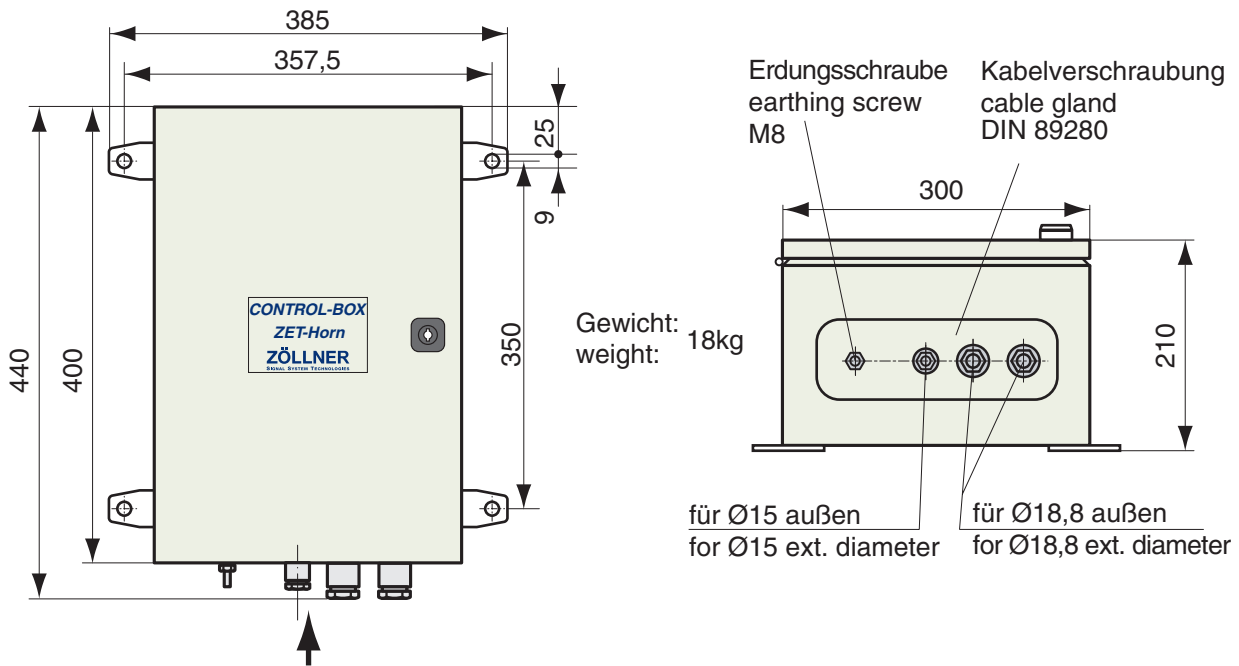
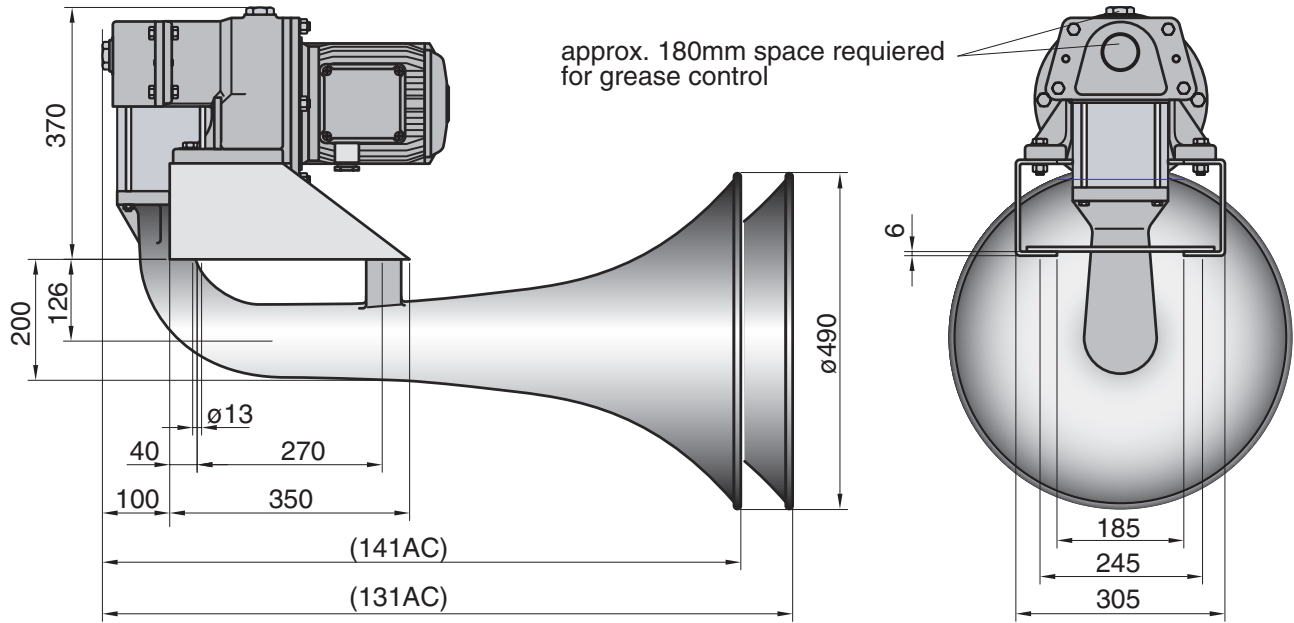
*Even when a background noise covers the actual basic frequency the residual tone forms a parent frequency in the human hearing. Two or three harmonics are sufficient for the hearing to perceive the basic frequency.*
- sound frequency of 130 Hz / 140 Hz very advantageously ranks in the lower admissible range (130-350 Hz)
- sound pressure level 138 dB in 1/3rd octave band at 1 m distance

### Advantages

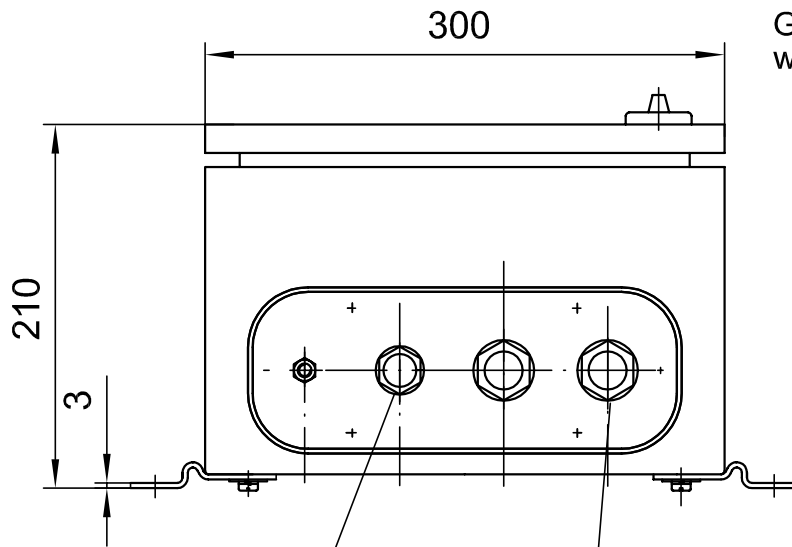
- decades of experience
- best material and workmanship - made in Germany
- simple but matured design
  - easy exchange of all parts with onboard tools
  - steady lubrication with standard grease (no oil!)
- cylinder suspended vertically to allow optimum discharge of spray, flood, condensation water or melted snow
- motor heating to avoid condensed water included as a standard,
  - no additional cable required!
- easy installation
  - only one three-core cable required for connection to board mains!
  - relatively low weight
- not affected by voltage and frequency fluctuations of board mains

# Positioning and installation

- Positioning as high as practicable on the vessel to reduce interception of the emitted sound by obstructions and to avoid hearing damage risk to the personnel.
- The sound pressure level of a vessel's own signal at listening posts must not exceed 110 dB(A).



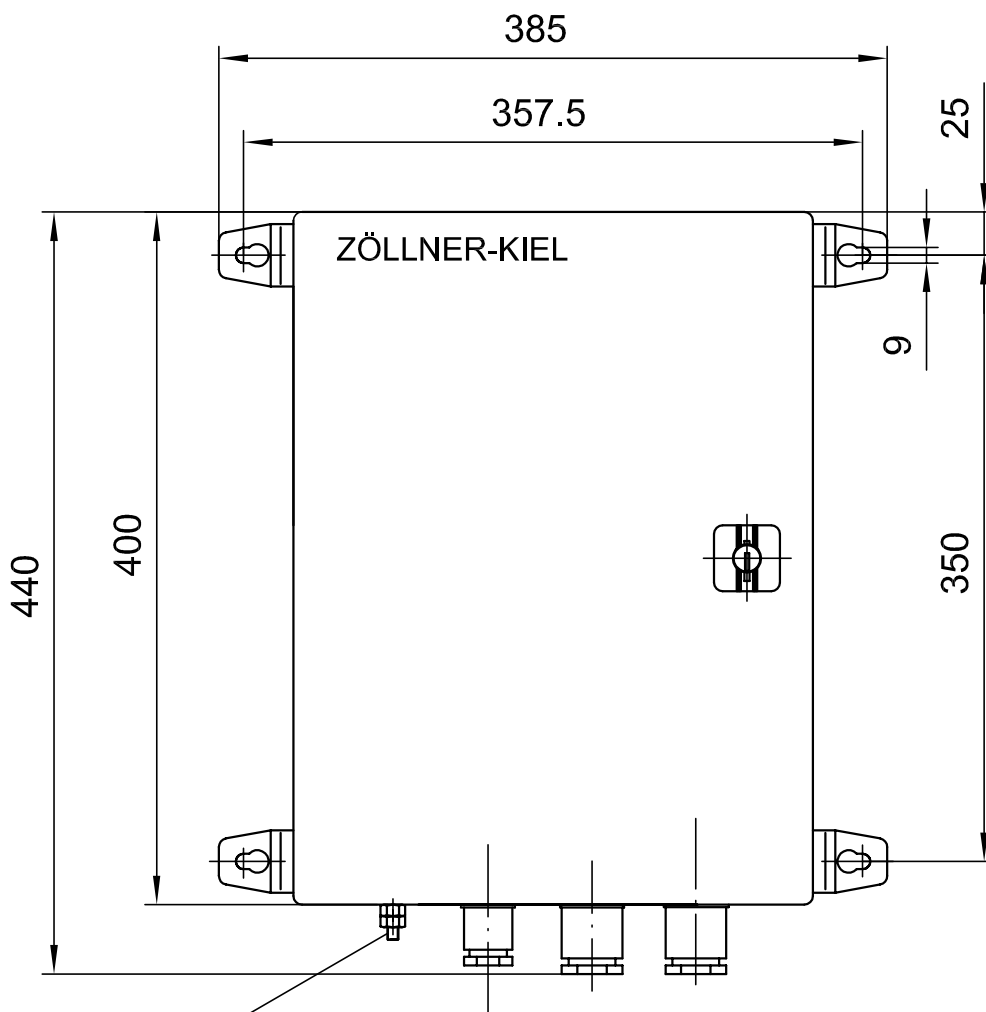
type	ship length [m]	current frequency		fundamental frequency [Hz]	sound intensity in 1/3rd-octave band level at 1 m distance		motor output [kW]	motor heating up to [W]	type approval BSH(DHI) no.	protection type	weight [W]
		50Hz	60Hz		dB(A)	min. IMO 1/3rd oct					
141AC	75-200	../5	../6	140	143	138 dB	5,5	250	49/01/78	IP 56	62
131AC	75-200	../5	../6	130	144	138 dB	5,5	250	49/01P/01/78	IP 56	62



Gewicht: ca. 18 kg  
weight approx. 18 kg

M24x1,5 für Kabel Ø15 aussen  
M24x1,5 for cable Ø15 ext. diam.

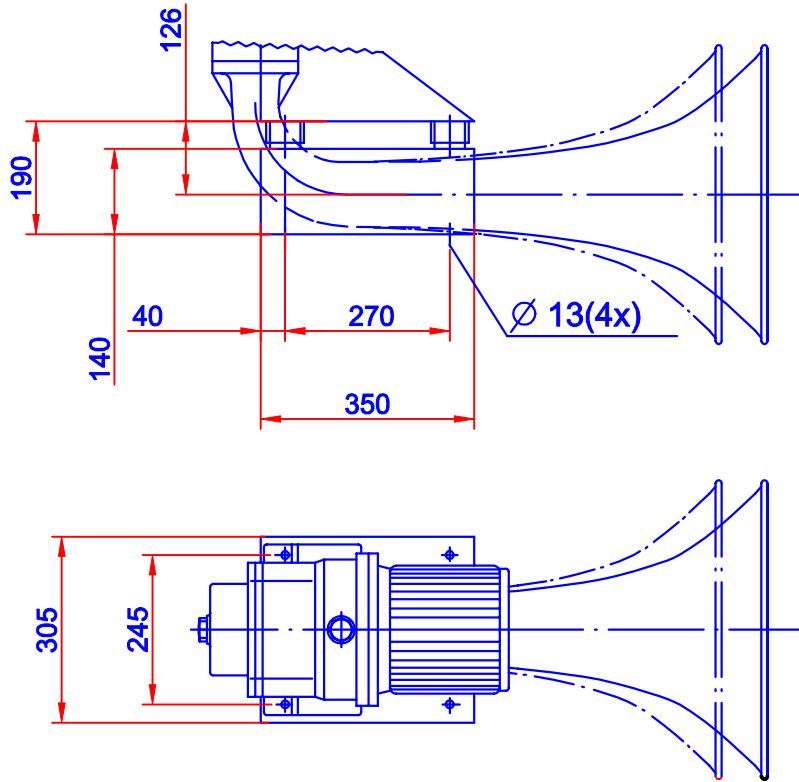
M30x2 für Kabel Ø18.8 aussen  
M30x2 for cable Ø 18.8 ext. diam.



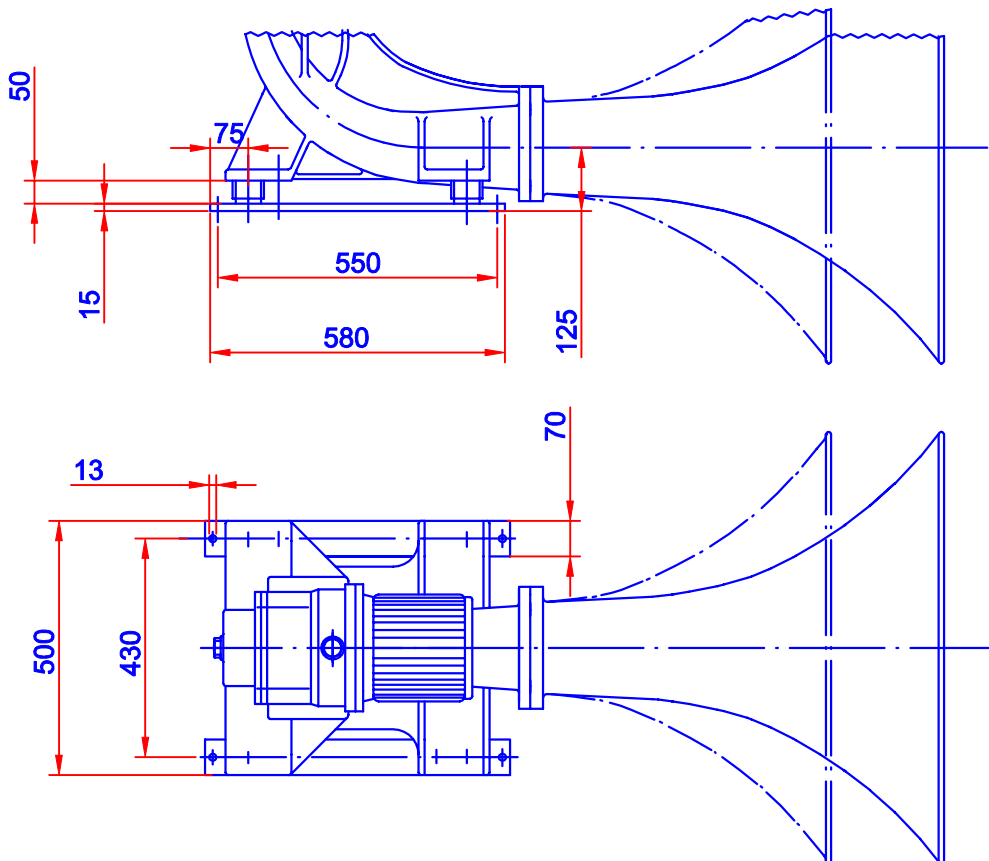
Erdungsschraube  
Earthing screw  
M 8

Kabelverschraubung nach DIN 89280 für MGCG-Kabel  
cable gland according to DIN 89280 for MGCG cable

141 AC  
131 AC



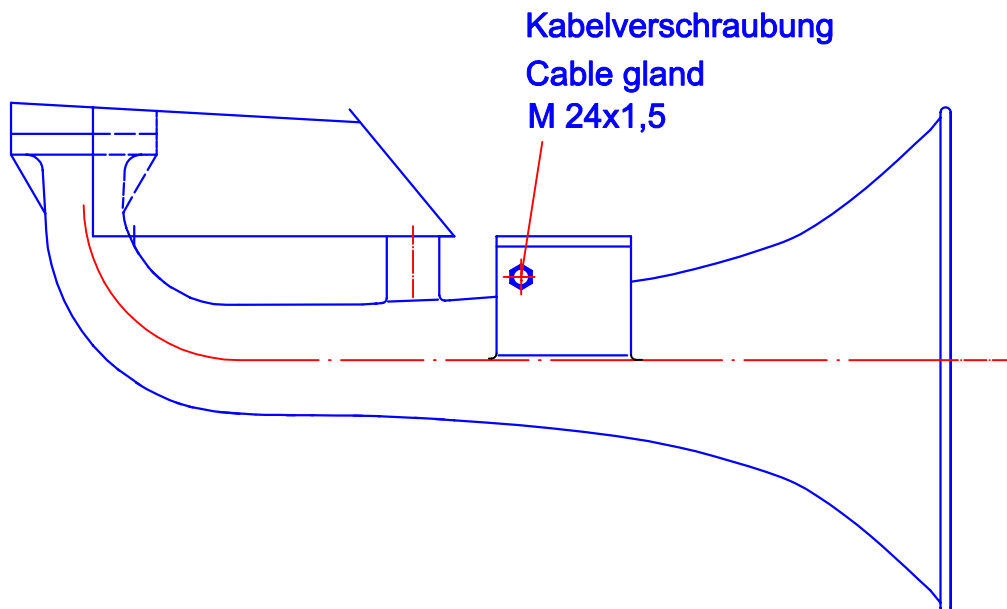
110 AC  
90 AC






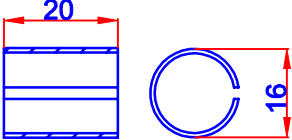
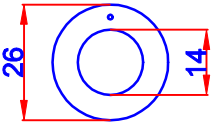
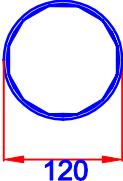
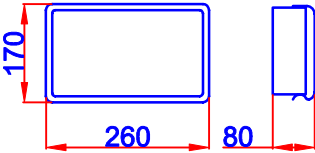
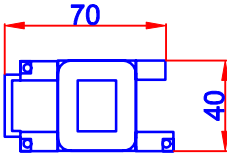
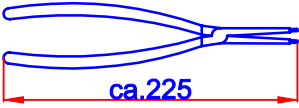
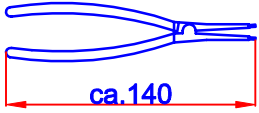
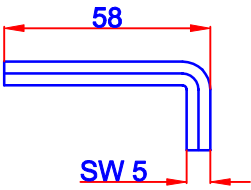
Zet-Horn 141 AC  
Zet-Horn 131 AC

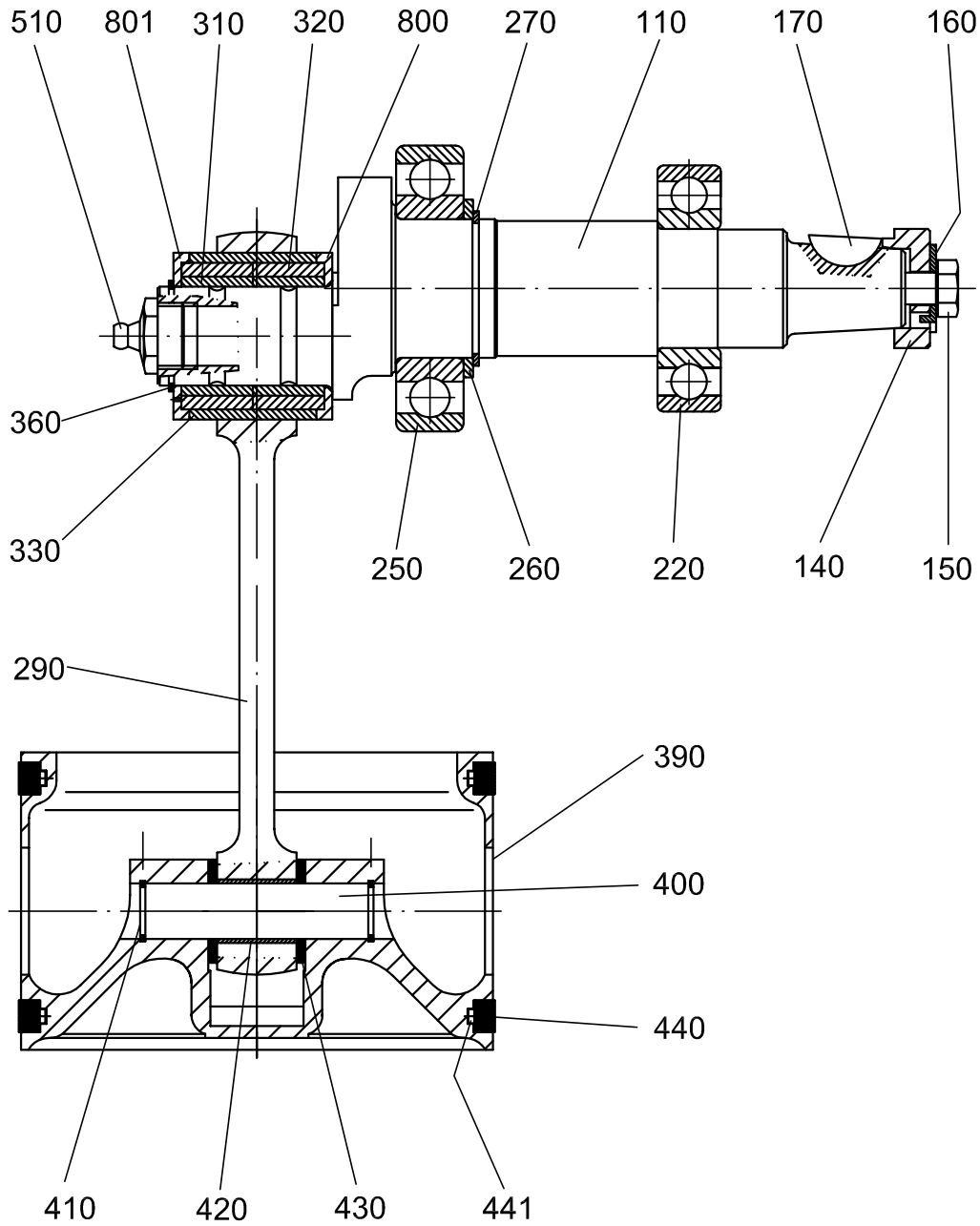
Heizung/heating  
1,7 KW bei 440V60Hz  
1,3 KW bei 380V50Hz



Stck. Qty.	Zeichnung Drawing	Benennung/techn.Daten Designation/techn.Data	Teil Nr. Part no.	Bestell-Nr. Order no.	Gewicht Weight
1		Rillenkugellager ball bearing  6206-2 RS1	8503-220	251062061	0,200
1		Rillenkugellager ball bearing  6207-2 RS	8503-250	251062071	0,280
2		Kolbenring m.Wellfeder piston ring with spring  Ø120/110x8	8503-440 -441	0105069 0104757	0,075

Stck. Qty.	Zeichnung Drawing	Benennung/techn.Daten Designation/techn.Data	Teil Nr. Part no.	Bestell-Nr. Order no.	Gewicht Weight
1		Rillenkugellager ball bearing  6206-2 RS1	8503-220	251062061	0,200
1		Sicherungsring safety ring  J62x2	8503-240	2572062	0,010
1		Rillenkugellager ball bearing  6207-2 RS1	8503-250	251062071	0,280
1		Sicherungsring safety ring  A35x1,5	8503-270	2571035	0,005
2		Innenring inside bearing ring  IR 25x30x18	8503-310	251900300	0,035
2		Nadelkäfig needle bearing cage  K 30x37x18	8503-320	251900200	0,035
1		Aussenring outside bearing ring  AR 37x42x32	8503-330	251900393	0,080
2		Anlaufscheibe thrust washer  Ø 42x4	8503-800 -801	0105260 0105320	0,025 0,025

Stck. Qty.	Zeichnung Drawing	Benennung/techn.Daten Designation/techn.Data	Teil Nr. Part no.	Bestell-Nr. Order no.	Gewicht Weight
1		Sicherungsring safety ring  A 25x1,2	8503-360	2571025	0,002
1		Buchse bush  14x16x20	8503-420	381001420	0,010
2		Anlaufscheibe guard plate  Ø14x26x1,5	8503-430	381001415	0,010
2		Kolbenring m.Wellfeder piston ring with spring  Ø120/110x8	8503-440 -441	0105069 0104757	0,075
1		Ersatzteilkasten box for spare parts  170x260x80		887002000	0,300
1		Ersatzspule für Schaltschütz spare colle for contactor  Spannung angeben ! State Voltage !		630686180	0,085
1		Montagezange für Sicherungsring innen pliers for mounting internal safety ring  I 3		9017003	0,184
1		Montagezange für Sicherungsring aussen pliers for mounting external safety ring  A 1		9018001	0,085
1		Innensechskantschlüssel allen key  SW 5		900205	0,025



*Order No.:*

Typ 90/110AC 01414385.1

Typ 131/141AC 01414385.2

Typ 130AC 01414385.3

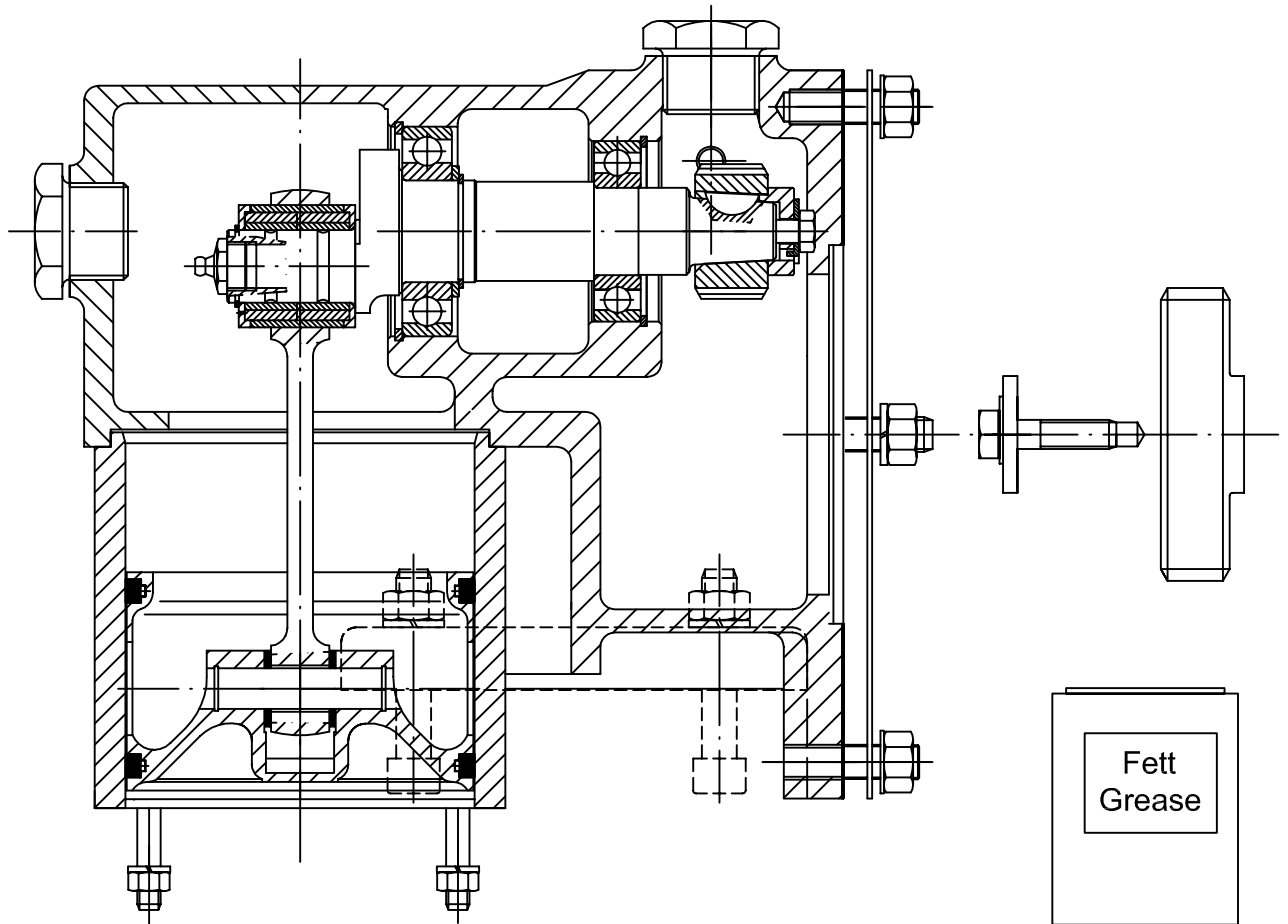
Teil part	Ident-Nr.	Stck. Qty.	Bezeichnung	Description	Techn. Daten techn. data
110	0104122	1	Kurbelwelle 131/141AC	crankshaft	188.5 lg
110	0104124	1	Kurbelwelle 90/110AC	crankshaft	188,5 lg
110	0104123	1	Kurbelwelle 130AC	crankshaft	188,5 lg
140	0103530	1	Sicherungsdeckel	washer	Ø 30x12
150	0103952	1	Sechskantschraube	hexagon screw	M 8x50
160	254208	1	Sicherungsblech	locking plate	8.4
170	22006075	1	Scheibenfeder	fitting key	6x7.5
220	251062061	1	Rillenkugellager	ball bearing	6206-2RS1
250	251062071	1	Rillenkugellager	ball bearing	6207-2RS1
260	253304525	1	Stützscheibe	support disk	SS 35x45x2.5
270	2571035	1	Sicherungsring	safety ring	A 35x1.5
290	0104117	1	Pleuelstange	connecting rod	145 lg
310	251900300	2	Innenring	inside bearing ring	IR 25x30x18
320	251900200	2	Nadelkäfig	needle bearing cage	K 30x37x18
330	251900393	1	Lageraußenring	outside bearing ring	AR 37x42x32
360	2571025	1	Sicherungsring	safety ring	A 25x1.2
390	0104362	1	Kolben	piston	Ø 120
400	885514562	1	Kolbenbolzen	wrist pin	Ø 14x56
410	2580014	2	Sprengring	safety ring	A 14x1
420	381001420	1	Buchse	type bush	Ø14x16x20
430	381001415	2	Anlaufscheibe	guard plate	Ø14x26x1,5
440	0105069	2	Kolbenring mit	piston ring with	Ø 120/110x8
441	0104757	2	Expanderfeder	spring	Ø 120
510	55615436	1	Schmiernippel	grease nipple	R 3/8"
800	0105260	1	Anlaufscheibe	thrust washer	Ø 42x4
801	0105320	1	Anlaufscheibe	thrust washer	Ø 42x4

**Bei Bestellung geben Sie bitte an:**

Zet-Horn Typ – Fabriknummer – Bauwerft –

**When ordering part please indicate:**

Zet-Horn type – Serial no. – shipbuilder –



**Bei Bestellung geben Sie bitte an:**

Zet Horn Typ-Seriennummer-Bauwerft-

**When ordering parts please indicate:**

Zet-Horn type-Serial No.- shipbuilder-

**Bestell Nr. kompl. / Order No.compl. :**

**Zet-Horn 141 AC : 0104270 149**

**Zet-Horn 131 AC : 0104270 139**

**Zet-Horn 110 AC : 0104270 119**

**Zet-Horn 90 AC : 0104270 099**

**Zet-Horn AC**

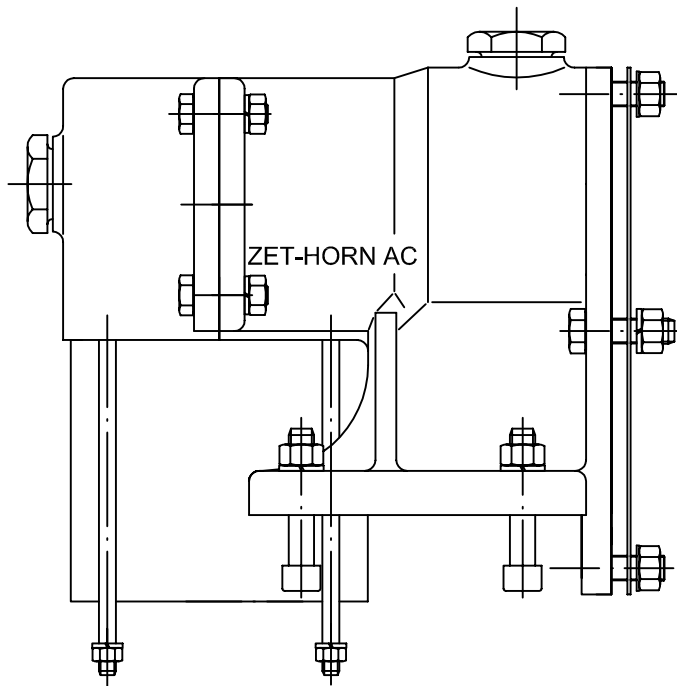
 Pos. Nr. entsprechend Betriebsanleitung 01808503 !  
 Part No. see under operating instructions 01808503 !

Teil part	Ident-Nr.	Stck. Qty.	Bezeichnung	Description	Techn. Daten techn. data
20	01036380	1	Gehäuse A + B	casing A + B	Mod.2954/55G
21	556154101	1	Schmiernippel	grease nipple	AM 10x1
22	20941011	1	Verschlußschraube	screw plug	M 10x1
23	2433000	1	Schmiernippelkappe	grease nipple cap	GPN 1300
40	0104487	1	Flanschdichtung	flange gasket	250/130/ x0.5
50	2046120301	2	Stiftschraube	stud bolt	M 12x30
60	2044120401	2	Sechskantschraube	hexagon screw	M 12x40
70	211300121	8	Sicherungsscheibe	washer	Ø 12x21x2,5
81	21034121	4	Sechskantmutter	hexagon nut	M12
110	0104122	1*	Kurbelwelle 141/131AC	crankshaft	188.5 lg
110	0104124	1⊗	Kurbelwelle 90/110AC	crankshaft	188,5 lg
120	01...	1	Zahnrad	gear wheel	
130	01...	1	Zahnrad	gear wheel	
140	0103530	1	Sicherungsdeckel	safety cap	Ø 30x12
150	0103952	1	Sechskantschraube	hexagon screw	M 8x50
160	254208	1	Sicherungsblech	locking plate	Ø8.4
170	22006075	1	Scheibenfeder	fitting key	6x7.5
180	0102817	1	Zahnradzscheibe	gear wheel disk	Ø 40x5
190	2043100406	1	Sechskantschraube	hexagon screw	M 10x40
200	254210	1	Sicherungsblech	locking plate	Ø10.5
220	251062061	1	Rillenkugellager	ball bearing	6206-2RS1
240	2572062	1	Sicherungsring	safety ring	J 62x2
250	251062071	1	Rillenkugellager	ball bearing	6207-2RS1
260	253304525	1	Stützscheibe	support disk	SS 35x45x2.5
270	2571035	1	Sicherungsring	safety ring	A 35x1.5
280	2572072	1	Sicherungsring	safety ring	I 72x2.5
290	0104117	1	Pleuelstange	connecting rod	145 lg
310	251900300	2	Innenring	inside bearing ring	IR 25x30x18
320	251900200	2	Nadelkäfig	needle bearing cage	K 30x37x18
330	251900393	1	Lageraußenring	outside bearing ring	AR 37x42x32
360	2571025	1	Sicherungsring	safety ring	A 25x1.2
380	0105039	1	Zylinder	cylinder	Ø 120
390	0104362	1	Kolben	piston	Ø 120
400	885514562	1	Kolbenbolzen	wrist pin	Ø 14x56
410	2580014	2	Sprengring	safety ring	A 14x1
420	381001420	1	Buchse	bush	Ø14x16x20
430	381001415	2	Anlaufscheibe	guard plate	Ø14x26x1,5
440	0105069	2	Kolbenring mit	piston ring with	Ø 120/110x8
441	0104757	2	Expanderfeder	spring	Ø120
450	0103526	1⊗	Trichterflansch	flange of horn	Ø130x59
460	0104546	4	Gewindestange	tie rod	M 8x175
470	211300081	4	Sicherungsscheibe	washer	Ø8x14,8x2
480	21037081	4	Sicherungsmutter	safety nut	VM 8
490	20983325	2	Verschlußschraube	screw plug	R1"
510	55615436	1	Schmiernippel	grease nipple	R 3/8"
520	50210655	1⊗	O-Ring	o-ring	Ø65x5
610	211300101	4	Sicherungsscheibe	washer	Ø10x18x2,2
680	933003700	1.000 kg	Getriebefett	gear grease	Aral Alarub FDP 00
690	24910	1	Typenschild	name plate	110x40
691	2122703061	4	Kerbnagel	grooved drive stud	Ø3x6
700	2044100351	4	Sechskantschraube	hexagon screw	M 10x35
710	21037101	4	Sicherungsmutter	safety nut	VM 10
720	212210025	2	Zylinderstift	locking bolt	10m6x24
800	0105260	1	Anlaufscheibe	thrust washer	Ø 42x4
801	0105320	1	Anlaufscheibe	thrust washer	Ø 42x4
820	0104120	1	Gehäusedichtung	casing gasket	229/127x0,25

\* nur/only 131AC/141AC

⊗ nur/only 90AC/110AC





**Bei Bestellung geben Sie bitte an:**  
 Zet Horn Typ-Seriennummer-Bauwerft-

**When ordering parts please indicate:**  
 Zet-Horn type-Serial No.- shipbuilder-

**Bestell Nr. / Order No.:**

**Zet-Horn (141,131,110,90) AC : 0107301**

Pos. Nr. entsprechend Betriebsanleitung 01808503 !  
 Part No. see under operating instructionen 01808503 !

Teil part	Ident-Nr.	Stck. Qty.	Bezeichnung	Description	Techn. Daten techn. data
20	01036380	1	Gehäuse A + B	casing A + B	
21	556154101	1	Schmiernippel	grease nipple	AM 10x1
22	20941011	1	Verschlusschraube	screw plug	M 10x1
23	2433000	1	Schmiernippelkappe	grease nipple cap	GPN 1300
40	0104487	1	Flanschdichtung	flange gasket	250/130/x0.5
50	2046120301	2	Stiftschraube	stud bolt	M 12x30
60	2044120401	2	Sechskantschraube	hexagon screw	M 12x40
70	211300121	4	Sicherungsscheibe	washer	Ø 12x21x2,5
81	21034121	4	Sechskantmutter	hexagon nut	M12
240	2572062	1	Sicherungsring	safety ring	l 62x2
280	2572072	1	Sicherungsring	safety ring	l 72x2.5
380	0105039	1	Zylinder	cylinder	Ø141/ 120
460	0104546	4	Gewindestange	tie rod	M 8x175
470	211300081	4	Sicherungsscheibe	washer	Ø8x14,8x2
480	21037081	4	Sicherungsmutter	safety nut	VM 8
490	20983325	2	Verschlusschraube	screw plug	R1"
610	211300101	4	Sicherungsscheibe	washer	Ø10x18x2,2
680	933003700	1.15 kg	Getriebefett	gear grease	Aral Aralub FDB 00
690	24910	1	Typenschild	name plate	110x40
691	2122703061	4	Kerbnagel	grooved drive stud	Ø3x6
700	2044100351	4	Sechskantschraube	hexagon screw	M 10x35
710	21037101	4	Sicherungsmutter	safety nut	VM 10
720	212210025	2	Zylinderstift	locking bolt	10m6x24
820	0104120	1	Gehäusedichtung	casing gasket	229/127x0,25