TOLERANCES ALLGEMEIN/GENERAL ISO 2768 T1 - v								
~ 0.5	3	6	30	120	400	1000	2000	4000
± 3	6	30	120	400	1000	2000	4000	
–	± 0,5	± 1	± 1,5	± 2,5	± 4	± 6	± 8	

TOLERANCES OF-FORM + POSITION DIN ISO 2768 T1

zugehörige Zeichnungen / corresponding drawings		
Bezeichnung / designation	Zeichnungsnummer / drawing number	Index
P&I Diagramm	PID-21124	–
-	-	-

TURBINE TYPE BSES-6

All steam piping must be arranged so that strains will not be imposed on the turbine. The total resultant force and total resultant moment at any connection should not exceed:

NEMA 8.4.6.1	500*De	
Inlet	0,668×FR +0,714×MR ≤	2958,7
Extraction	0,668×FR +0,714×MR ≥	2465,6
Exhaust	0,668×FR +0,714×MR ≥	5959,4

The combined resultants of the forces and moments of the inlet and exhaust connections, resolved at the centerline of the exhaust connection, should not exceed:

NEMA 8.4.6.2.a	250×Dc	
global	0,445×FC +0,714×MC ≤	3261,1

The components of the combined resultants should not exceed:

NEMA 8.4.6.2.b	Results
Fxc=8,84×Dc	2928,4 N
Fyc=22,09×Dc	7321,1 N
Fzc=17,68×Dc	5856,9 N
Mxc=44,19×Dc	4565,5 Nm
Myc=22,09×Dc	2282,7 Nm
Mzc=22,09×Dc	2282,7 Nm

Comments:
All forces in (N) and all moments in (Nm)
FR= (FX^2 + FY^2 + FZ^2)^0,5 MR= (MX^2 + MY^2 + MZ^2)^0,5
FC= (FX^2 + FY^2 + FZ^2)^0,5 MC= (MX^2 + MY^2 + MZ^2)^0,5

VERTICAL
PARALLEL TO TURBINE SHAFT

Estimated Thermal Movement at rated conditions

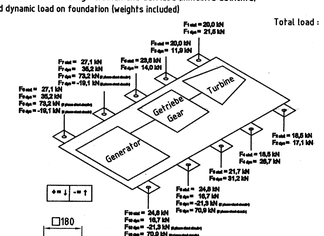
Inlet Flange A :
-2,13 mm in x-direction
+2,62 mm in y-direction
+7,32 mm in z-direction

Outlet Flange B :
-0,15 mm in x-direction
+0,41 mm in y-direction
0,00 mm in z-direction

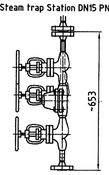
Bleed Flange F :
-1,63 mm in x-direction
-0,88 mm in y-direction
2,24 mm in z-direction

Statische Fundamentbelastung Turbinen und Getriebe (inklusive Gewichte)
static and dynamic load on foundation (weights included)

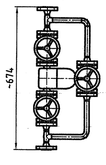
Total load : 226,1 kN
23.05 t

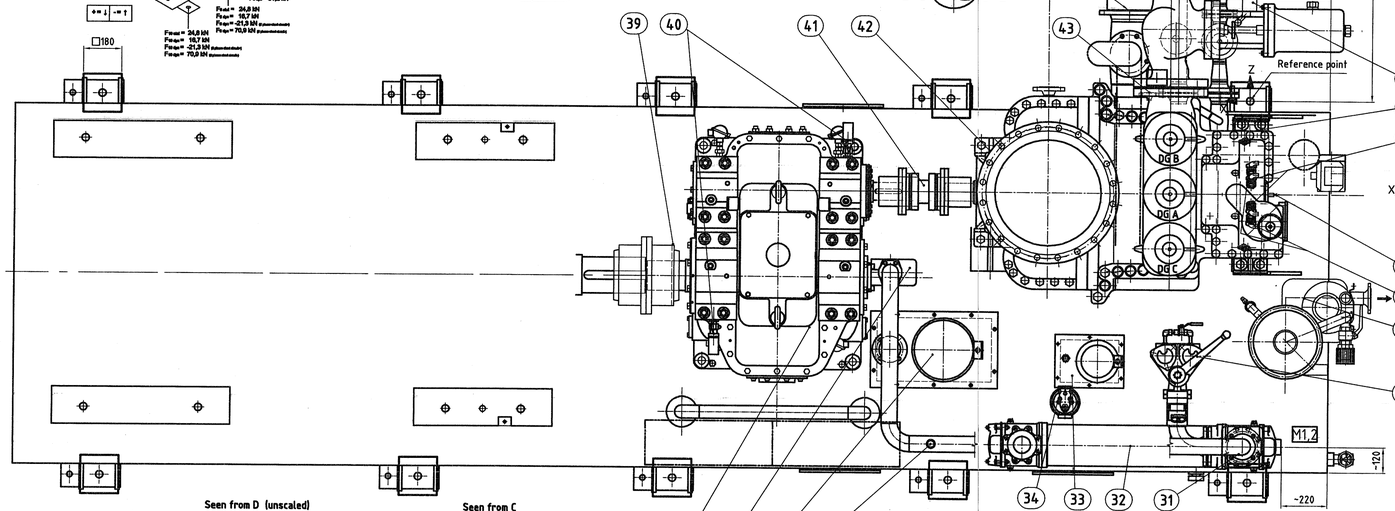


Steam trap Station DN15 PN100 vert.

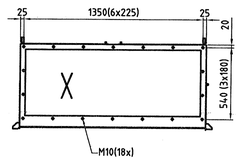


Steam trap station DN15 PN40 horiz.

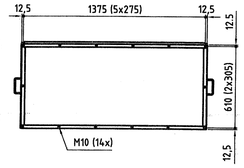




Seen from D (unscaled)



Seen from C



Dimensions for leak off and cooling water conn. cannot be fix before monted.

Pos.	Customer Connections – TURBINE Description	DN/SIZE	PN	DIN	X,Y,Z from reference point X	Y	Z
A	Steam inlet Turbine	150	100	2637	375	1490	1298
B	Steam exhaust Turbine	500	10	2632	950	1721	-440
D	Steam trap steam inlet	15	100	2637	352	580	324
E	Leak off steam HD	65	40	2635	338	565	1127
F	Bleed Steam Turbine	150	16	2633	571	563	425
H	Steam trap conn. bleed	15	40	2635	571	342	285
I	Steam trap conn. 1. stage	15	40	2635	442	469	37
K	Leak off steam HD	65	40	2635	146	565	37
L	Con. air control Service unit	GI 1/4					
M1	Cooling water oil cooler inlet	80	16	2501	-160	640	-1630
M2	Cooling water oil cooler outlet	80	16	2501	-160	760	-1630

consec.no.	PID-Nr.	Benennung und Bemerkung	Description
61	PT 20E21	Druckmessumformer Zudampf	Pressure transmitter steam inlet
60	80 FV12, 80V12	Wartungseinheit, Sperrluft	Service unit, purge air
59	PT 22E22	Druckmessumformer Abdampf	Pressure transmitter steam exhaust
58	PI 20C11	Manometer f. Zudampfdruck	Pressure gauge for steam inlet
57	PI 22C11	Manometer f. Abdampfdruck	Pressure gauge for steam exhaust
56	TT/TI 61E42	Temp.-Transmitter Öl	Control oil temperature
55	PT/PI 71E21	Drucktransmitter Schmieröldruck	Oil press. control for aux.oil pump
54	PS 61E21	Druckschalter f. Elektr.Hilfsölpumpe	Pressure swifch f. aux. oil pump
53	PT/PI 61E31	Drucktransmitter Steueröldruck	Press.transmitter control oil
52	PI 70C12	Manometer Öldruck Not-Ölpumpe	Pressure gauge oil press. el.emergency oil pump
51	PI 70C11	Manometer f. Schmieröldruck	Pressure gauge for lub oil pressure
50	PI 61C11	Manometer f. Steueröldruck	Pressure gauge for control oil pressure
49	PI 25C11	Manometer Entnahme	Pressure gauge extraction
48	TE 22E41	PT 100 Abdampftemperatur	PT 100 steam exhaust temperature
47	TE 22E41	PT 100 Abdampftemperatur	PT 100 steam exh. temp.
46	TE 18E12/21	PT-100 für Öltemperatur Lager I und II Turbine	PT-100 f oil temperature turbine bearing
45	61Y11	Öldruckbegrenzungsventil	Oil pressure relief valve
44	TE 38E11/21/31/41	PT-100 für Öltemperatur Lager I-IV Getriebe	PT-100 oil temp. bearing gear I-IV
43	23D12, 23V14-16	Anschl. Kondensatstation Druckstufe DN15 PN40	Con.steam trap station press.stage DN15 PN40
42	GE 10E62	Vorbereitung Schwingungsaufnehmer Lager II	Vibration pick up provision
41	35A11	Kupplung	Coupling
40	VT 30E61	Schwingungsaufnehmer am Getriebe	Vibration pick up for gearing
39	35A20	Kupplung	Coupling
38	30A11	Getriebe	Gear box
37	60P11	Hauptölpumpe	Main oil pump
36	M 60M21/60P21	Elektro-Hilfsölpumpe	Electric auxiliary oil pump
35	TI 61C41	Stabthermometer Öltemperatur	Stem-Thermometer oil temperature
34	71F11	Ölfilter	Oil filter
33	70P11,M 70M11	Not-Elektro-Hilfsölpumpe	Electric emerg. auxiliary oil pump
32	61W11	Ölkühler, Anschl.	Oil cooler, con.
31	61V41	Temperaturregelventil	Oil termostatic valve
30	61F11, PDI 61E81	Doppel-Ölfilter	Double oil filter
29	51F11/M51M11	Ölnebelabscheider	Oil demister
28	SE 11E13/14	Aufnehmer Schnellschlußauslöseventil	Overspeed release pick up
27	GE 10E81	Aufnehmer zur Axialverschiebesicherung	Pick-up f. axial displacement messuring
26	SE 11E11/12	Drehzahlaufnehmer	Speed pick up
25	GE 10E61	Vorbereitung Schwingungsaufnehmer Lager I	Vibration pick up provision
24	GS 20E81	Endlagenschalter SSV	Limit switch trip valve
23	23B11	Kondensathebestation DN25 PN16	Condensate elevation station
22	--	Reinigungsdeckel	Cleaning cover
21		Abdampf-Entwässerung DN40 PN16	Drain steam exhaust DN40 PN16
20	23D11, 23V11-13	Anschl. Kondensatstation Druckstufen DN15 PN40	Con. steam trap station press.stage DN15 PN40
19	50B11	Grundplatte m.integriertem Öltank Inhalt ~ 1500 l	Baseplate w.integrated oil tank content: ~ 1500 l
18	52S11	Ölablaßschieber: G1 1/2	Gate valve for oil: G1 1/2
17	LI 51G11	Ölschauglas	Oil level indicator
16		Leckdampfaustritt DN65 PN40	Leak off drain DN65 PN40
15	21D11, 21V11-13	Kondensatstation Anschl. DN15 PN100	Steam trap station, con. DN15 PN100
14	ES/GE 11E21, 11V21	Druckstellglied/Steuerschieber	Pressure actuater/hydr. spool valve
13	PI 20E14	Manometer f. Düsengruppe B	Pressure gauge for nozzle group B
12	PI 20E13	Manometer f. Düsengruppe A	Pressure gauge for nozzle group A
11	PI 20E12	Manometer f. Düsengruppe C	Pressure gauge for nozzle group C
10	--	Sperrdampfleitung	Sealing steam pipe
9	EZ 11E71/72	Magnetventil	Solenoid valve
8	GE 11E41	Wegaufnehmer am Steuerwellenantrieb	Displacement transducer at control shaft drive
7	20F11/TE 20E41	Dampfsieb mit PT-100	Steam strainer with pt-100
6	10F11	Belüftungsfilter	Ventilation filter
5	20Y11	Schnellschlußventil	Quick action stop valve
4	TE 18E11/21	PT 100 Öltemperatur Turbinenlager 1	PT 100 oil temp. turbine bearings 1
3	11C61	Düsengruppensteuerung	Nozzle group controller
2	--	Wrasenabzug	Leak off vapour
1	20V21/31/41	Düsengruppenregelventile	Nozzle group control valves

TURBINE			
Entnahme Bleed steam	DN 150	PN 16	DIN 2633
Zudampf Steam inlet	DN 150	PN 100	DIN 2637
Abdampf Steam exhaust	DN 500	PN 10	DIN 2632

Index	Datum	Name	Art der Änderung / kind of change
08	28.12.07	Thölmann	as built
05	07.12.2007	Volkkamp	Drain steam exhaust and condensate elevation station, connection changed
04	04.12.07	Thölmann	Return valve extract.add, steam traps DN15PN100+DN15PN40 design.,Gen. changed
03	29.08.07	Thölmann	Coordinates for oil cooler in- and outlet X= -160, list of coordinates corr.
02	17.07.07	Thölmann	Bleed DN160 PN16 dimensions corr.
01	30.05.07	Thölmann	Title block of Europower add.

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DRESSER-RAND
Dresser-Rand Holzwerth Turbinen GmbH
D-88250 Weingarten Germany

Kunde/Customer: Europower SPA

Maßstab / scale	Projektion / Projection	Benennung / designation
1:10		Maßzeichnung Dampfturbinenaggregat / Outline drawing steam turbine aggregat

Projektleiter/Manager	Datum/Date	Auftrag Nr. /Order No.:	Projektnr./Projection:
Meyer Johann	22.05.07	21124/01	21024
Zeichner/Designer	Datum/Date	Dateiname/File name:	
Thölmann	24.04.07	00124_BSES6-GN16-C_A0	
Kontrolleur/Engineer	Datum/Date	Typ / Type:	Zeichnungsnummer / drawing number: OD-21124
U.Bruning	28.12.07	BSES-6-GN16+Gen	Index: -06

Blatt/Page: 1 / 1

Rev. Nr.	Datum di approvazione Approval date	Scopo emissione Issue purpose	Descrizione della revisione Revision description	Redatto Prepared by	Controllato Checked by	Approvato Approved by
01	30.05.07	I	new title block	Thölmann	G. Pietropoli	M.Lollini
0	XXXX	I	First emission	XXXX	XXXX	M.Lollini

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IMPIANTO DI PRODUZIONE DI ENERGIA ELETTRICA
"CENTRALE ITALTRACTOR"

Cliente / Client: SI.VEI. SNC

Titolo / Title: OUTLINE DRAWING SECTION TURBINE

Documento n° / Document n°	Revisione / Revision	Sostituisce / Replaces
21024-EDR-M-051	08	

Commessa n° / Job n°	Formato / Size	Scala / Scale	Foglio / Sheet	DI / of
21024	A0	1:10	1	1

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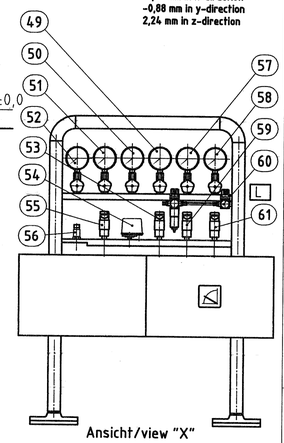
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