

	Inhaltsverzeichnis-Dokumentation Contents-Documentation	Datum/Date: 30.06.2005 Name: Meschenmoser
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ALLWEILER Auftrags-Nr.: 1005519
ALLWEILER Job No.:

Kunde: Air Liquide AGS gmbH, Krefeld
Customer:

Bestellung-Nr.: 4500024254
Order No.:

Positions-Nr.: 20
Item No.:

TAG-No. P14100 / P14200

Prüfprotokoll mit Prüfkennlinie Performance Test	DIN 55350-18-4.2.2
Zul. Stutzenbelastung Kräfte u. Momente Admissible nozzle forces	
Einbauzeichnung ALL2CAD Dimension drawing	NT 2/40-250
Schnittzeichnung Sectional drawing	041-633 (alte Nr. 4610000007)
Stückliste Pumpe Bill of Material	Ident-Nr. 561634
Motordatenblatt Data Sheet	
Betriebsanleitung Pumpe Operating Instructions	VM 460.0002 Ident-Nr. 550088
Betriebsanleitung AVM-Motor Operating Instructions	

Hersteller / Manufacturer:

ALLWEILER AG

A Member of the
COLFAX PUMP GROUP
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Allweilerstraße 1 . 78315 Radolfzell
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E-mail: service@allweiler.de
<http://www.allweiler.com>

Certificate acc. to DIN 55350-18- 4.2.2
Performance Test of centrifugal Pumps



Data of Pump

cust.order no.	: 4500024254	customer	: Air Liquide AGS GmbH
order no.	: 1005519/20	curve-no.	:
pump type	: NT 2/40-250/01 W1	item-no.	: P14100/P14200
pump no.	: Q 5005852	material-casing	: EN-GJL-250
		material-impeller	: EN-GJL-200
		material-shaft	: 1.4021

remark :

power absorbed	: 26,4 kW	power driver	: 37 kW
nominal speed	: 2900 1/min	impeller	: 225 mm
capacity	: 50 m³/h	delivery head	: 100,1 m.

liquid pumped	: water/cooling water	test liquid	: water
density	: 1 kg/dm³	test density	: 1 kg/dm³
temperature	: 12 °C	test temp.	: 20 °C
kin. viscosity	: 1 mm²/s	kin. viscosity	: 1 mm²/s

Data of Test-Rig

DN_s	: 65 mm	referring documents	
DN_d	: 40 mm	(X) DIN EN ISO 9906	Cl. 2 (X) Cl. 1 ()
meas.pt.diff.	: 0 bar	() API 610	
meas.tube	: 6		

test values of pump

* : calculation to rated density and speed

Nr	M Nm	n 1/min	Pzu kW	Hsa m.	Hdr m.	Hv m.	Q m³/h	Q* m³/h	H* m.	Pzu* kW	Eta %
1	84,2	2700	23,8	-2,08	62,2	6,11	53,5	57,5	81,2	29,49	43,16
2	79,1	2701	22,38	-1,58	76,59	4,66	46,8	50,2	95,48	27,71	47,18
3	71,3	2701	20,17	-0,68	92,22	2,96	37,2	40	110,5	24,97	48,22
4	58,7	2701	16,6	0,22	101,31	1,2	23,7	25,5	117,92	20,55	39,86
5	48,3	2700	13,65	0,56	104,42	0,33	12,4	13,3	120,2	16,92	25,7
6	36,8	2701	10,41	0,51	104,89	0	0,0	0,0	120,33	12,88	0,12

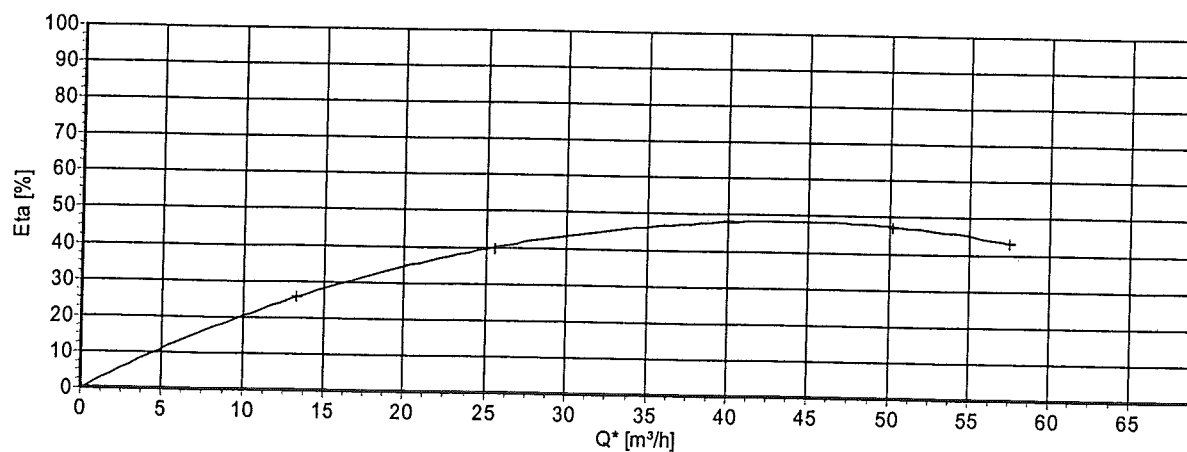
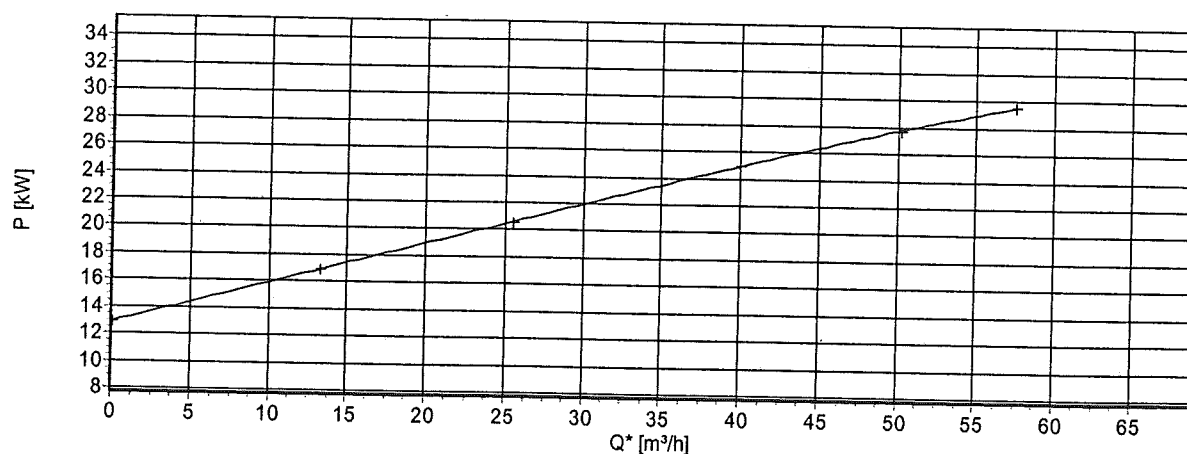
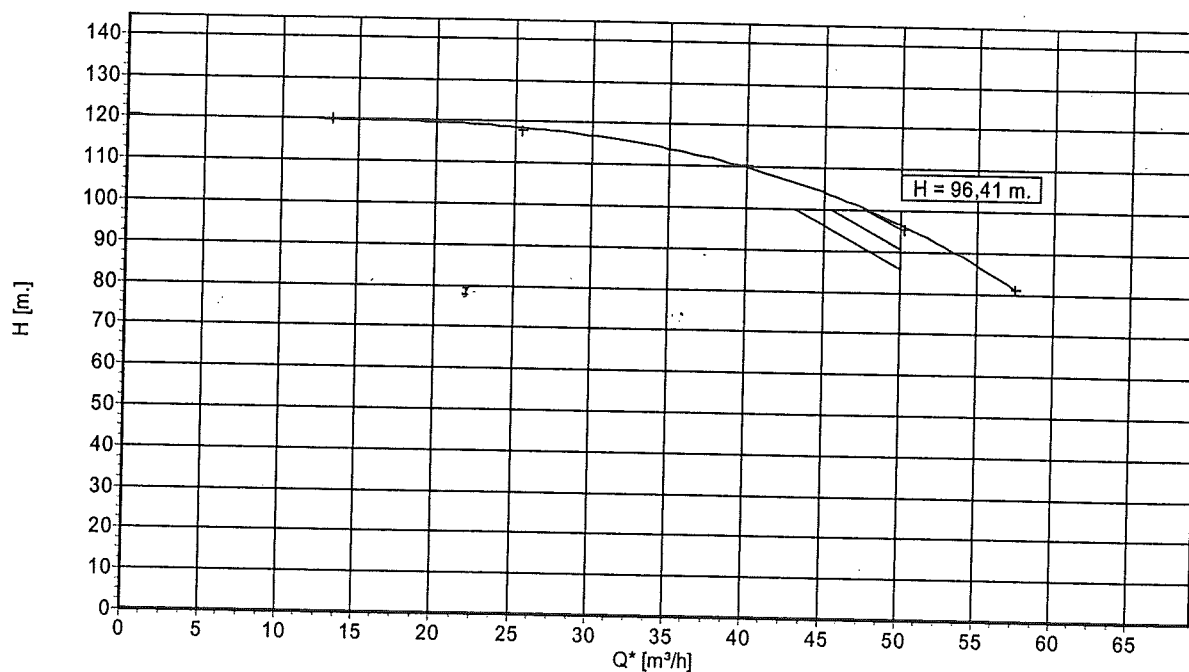
test pressure : 21 bar

_____ Berner
date Test Operator

_____ Auth.Insp.Agency

Test protocol is electronically processed and valid without signature.

order no.	: 1005519/20	pump no.	: Q 5005852	item-no.	: P14100/P14200
				impeller	: 225 mm
		nominal speed	: 2900 1/min	density	: 1 kg/dm ³
pump type	: NT 2/40-250/01 W1			kin. viscosity	: 1 mm ² /s



Certificate acc. to DIN 55350-18- 4.2.2
Performance Test of centrifugal Pumps



Data of Pump

cust.order no.	: 4500024254	customer	: Air Liquide AGS GmbH
order no.	: 1005519/20	curve-no.	:
pump type	: NT 2/40-250/01 W1	item-no.	: P14100/P14200
pump no.	: Q 5005853	material-casing	: EN-GJL-250
		material-impeller	: EN-GJL-200
		material-shaft	: 1.4021

remark :

power absorbed	: 26,4 kW	power driver	: 37 kW
nominal speed	: 2900 1/min	impeller	: 225 mm
capacity	: 50 m³/h	delivery head	: 100,1 m.

liquid pumped	: water/cooling water	test liquid	: water
density	: 1 kg/dm³	test density	: 1 kg/dm³
temperature	: 12 °C	test temp.	: 20 °C
kin. viscosity	: 1 mm²/s	kin. viscosity	: 1 mm²/s

Data of Test-Rig

DN_s	: 65 mm	referring documents	
DN_d	: 40 mm	(X) DIN EN ISO 9906	Cl. 2 (X) Cl. 1 ()
meas.pt.diff.	: 0 bar	() API 610	
meas.tube	: 6		

test values of pump

* : calculation to rated density and speed

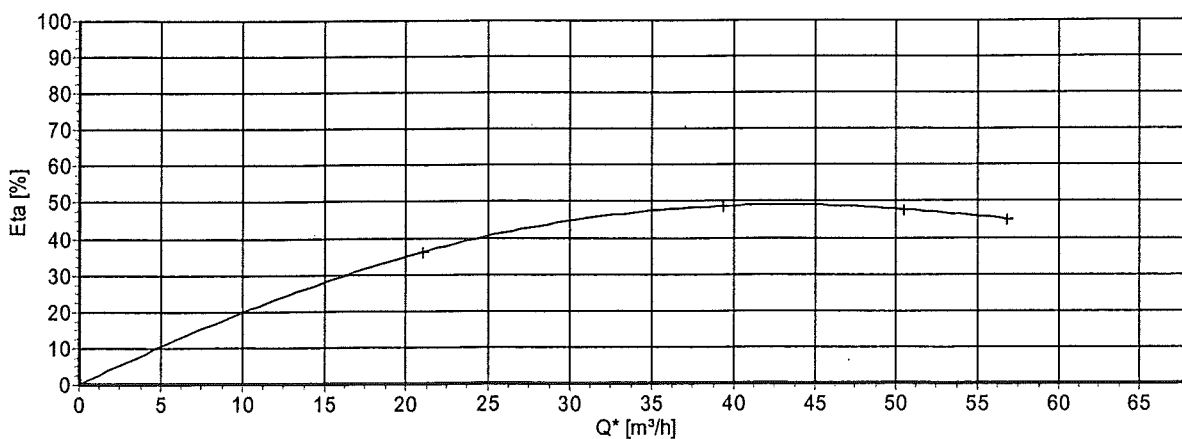
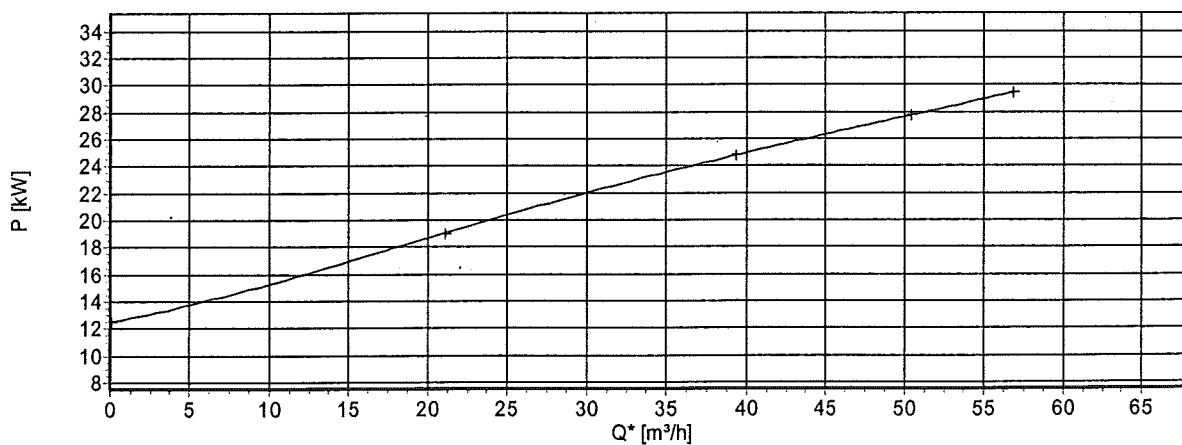
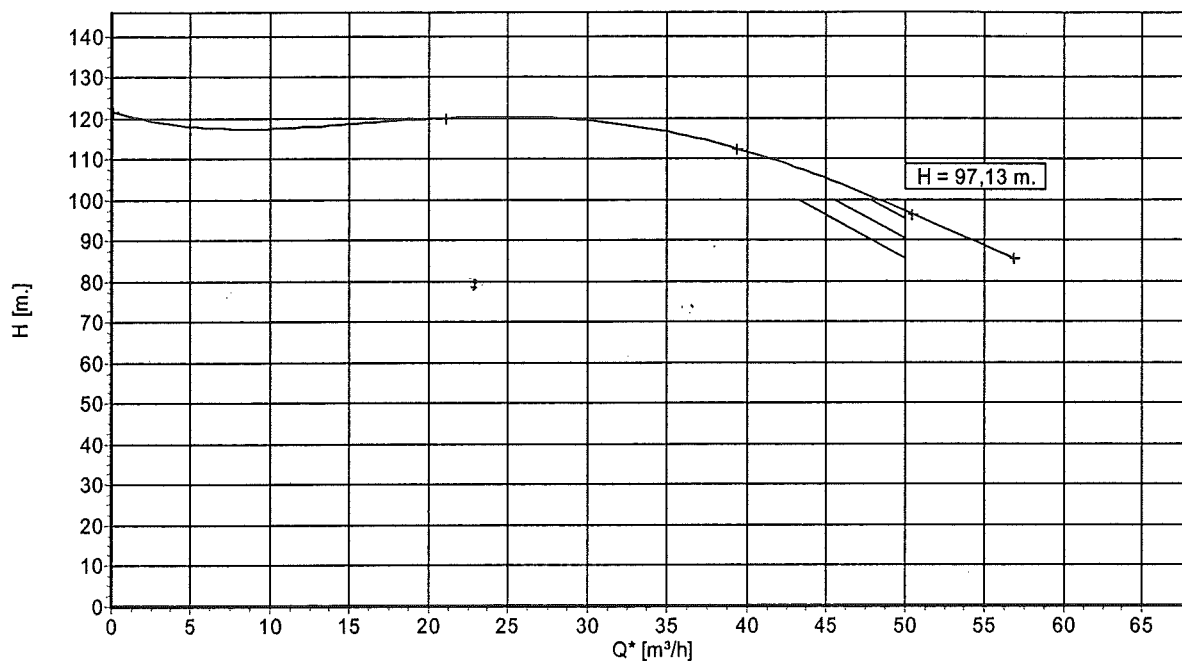
Nr	M Nm	n 1/min	Pzu kW	Hsa m.	Hdr m.	Hv m.	Q m³/h	Q* m³/h	H* m.	Pzu* kW	Eta %
1	84,2	2702	23,82	-2,08	66,24	5,97	52,9	56,8	85,58	29,45	44,99
2	79,2	2701	22,41	-1,44	77,44	4,71	47	50,5	96,36	27,73	47,78
3	70,8	2700	20,01	-0,63	94	2,87	36,7	39,4	112,48	24,79	48,71
4	54,3	2700	15,35	0,39	103,65	0,82	19,6	21,1	120,07	19,03	36,22
5	35,7	2700	10,11	0,71	106,06	0	0,1	0,1	121,53	12,52	0,25

test pressure : 21 bar

	Berner	
date	Test Operator	Auth.Insp.Agency

Test protocol is electronically processed and valid without signature.

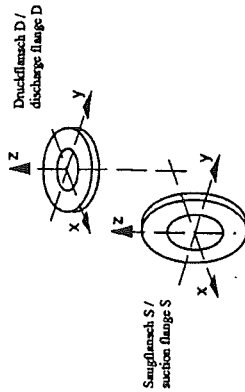
order no.	: 1005519/20	pump no.	: Q 5005853	item-no.	: P14100/P14200
				impeller	: 225 mm
		nominal speed	: 2900 1/min	density	: 1 kg/dm ³
pump type	: NT 2/40-250/01 W1			kin. viscosity	: 1 mm ² /s



Zulässige Stützenbelastung: Kräfte und Momente (entspr. ISO 5199)

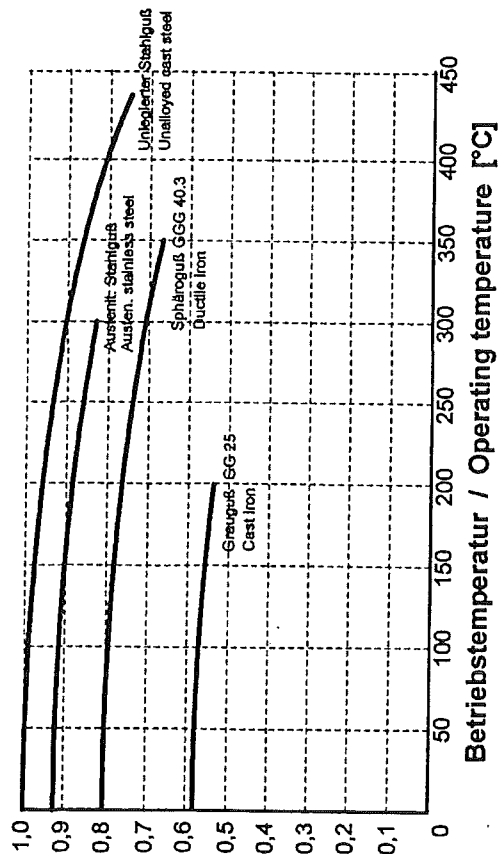
Admissible nozzle forces (acc. to ISO 5199)

Pumpen mit Stützfuß ϕ / Pumps with support foot ϕ	Pumpen ohne Stützfuß / Pumps without support foot
$\sum M_i = \sum (M_{is} + M_{id}) \leq M_{i, \max}$ $\sum F_h = \sum (F_{hs} + F_{hd}) \leq F_{h, \max}$ $\sum F_v = \sum \left(F_{vs} + \frac{2}{3} F_{vd} \right) \leq F_{v, \max}$ $\left(\frac{\sum F_v }{F_{v, \max}} \right)^2 + \left(\frac{\sum F_h }{F_{h, \max}} \right)^2 + \left(\frac{\sum M_i }{M_{i, \max}} \right)^2 \leq 1$	$\sum M_i = \sum M_{is} + 3 \times \sum M_{id} + \sum M_z \leq M_{i, \max}$ $\sum F_h = \sum F_{hs} + 2.5 \times \sum F_{hd} + \sum F_z \leq F_{h, \max}$ $\sum F_v = \sum \left(F_{vs} + \frac{2}{3} F_{vd} \right) \leq F_{v, \max}$ $\left(\frac{\sum F_v }{F_{v, \max}} \right)^2 + \left(\frac{\sum F_h }{F_{h, \max}} \right)^2 + \left(\frac{\sum M_i }{M_{i, \max}} \right)^2 \leq 1$



ϕ auch für Pumpen ohne Stützfuß aber mit Kupplung mit hohem zulässigem Wellenversatz /
 ϕ also for pumps without support foot but with coupling with large permissible misalignment

Korrekturfaktor M / Correction factor M



Betriebstemperatur / Operating temperature [°C]

Werte, gültig für nicht ausgegossene Grundplatte

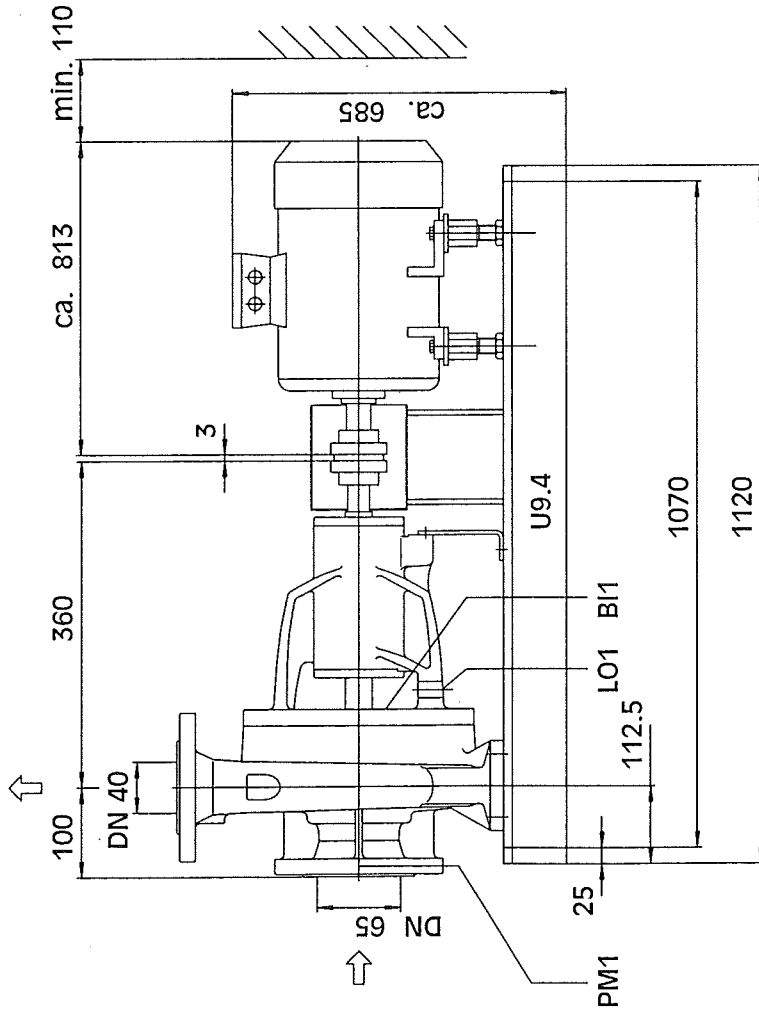
Values for not grouted baseplates

Pumpengröße	$F_{v, \max}$ (N)	$F_{h, \max}$ (kN)	$M_{i, \max}$ (Nm)
20-160	1300	1000	200
25-160	2000	1400	400
25-200	1900	1400	350
32-160	2300	1600	500
32-200	2100	1500	450
32-250	2500	1700	550
40-160	2700	1800	650
40-200	2400	1700	550
40-250	2800	1900	700
40-315	2900	2000	700
50-160	3200	2100	800
50-200	2800	1900	700
50-250	3200	2200	850
50-315	3300	2200	850
65-160	4200	2800	1200
65-200	4500	2900	1300
65-250	4900	2600	1100
65-315	4700	3100	1400
65-400	3200	2200	850
80-160	5300	3400	1650
80-200	5600	3600	1700
80-250	4900	3200	1400
80-315	5900	3800	1850
80-400	5400	3500	1650
100-160	5000	3200	1500
100-200	7000	4400	2300
100-250	7900	5000	2700
100-315	7200	4600	2400
125-200	7300	4600	2400
125-250	9700	6100	3450
125-315	8500	5400	2950
125-400	8600	5400	2950
150-200	12600	8000	4800
150-250	12800	8000	4850
150-315	13200	8300	5050
150-400	11400	7200	4200
150-500	12100	7800	4550
200-250	16900	10800	6600
200-315	17500	11200	7000
200-400	16000	10100	6300
200-500	16700	10700	6650
250-315	19800	13100	7350
250-400	19800	13100	7400

Der Ableswert ist mit dem Korrekturfaktor M, in Abhängigkeit von Werkstoff und Temperatur zu multiplizieren!
 The chart value has to be multiplied with the correction factor M in dependence on material and temperature!

Rev.	Änderungs-Nr. / Revision no.	Datum / Date	Name	Auftrags-Nr. / Order no.	Zul. Stützenkräfte und -momente / Admissible nozzle forces	Zeichnungs-Nr. / drawing no.
						094-732-001

Zeichnung nicht masstäblich / Drawing not-to-scale



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Zulässige Abweichungen fuer Masse ohne Toleranzangabe nach DIN EN 735	Permissible tolerances for dimensions without tolerancing acc. to DIN EN 735	Die Ausführung muss der bildlichen Darstellung nicht entsprechen. Installation has not to be executed in accordance with the plotting.	
ALLWEILER AG Werk Radolfzell Postfach 1140 D-78301 Radolfzell ALLCAD 03.06.02		Benennung/Description Einbauzeichnung / Dimension drawing NT 2/40-250 - Motor 200L	
Stuetzfuess optional / Standard ist ohne Supporting foot as option / Standard is without *Fremdsperrung bei Packungsstoppbuche/ External sealing by stuffing box		Hilfsanschluesse / Auxiliary connections	
B1*	Sperrung - Eintritt / Sealing - Inlet	---	
FF1	Foerdergut-Auffuellung / Liquid-recharging	G1/4	
PM1	Druckmessung / Pressure measurement	---	
PM2	Druckmessung / Pressure measurement	G1/4	
L01	Leckage - Austritt / Leakage - outlet	G3/8	
FD1	Foerdergut - Entleerung / Liquid - drain	G1/4	
Zeichen Symbol	Anschlussbezeichnung / Connection designation	Grosse Size	

Kunde/Customer:

Projekt/Project:

Angebot/Auftrag/Offer/Order:

Allweiler AG * Allweilerstrasse 1 * 78315 Radolfzell * Germany * Tel. +49(0)7732 86-0 * Fax +49(0)7732 86-552

Bill of Material: 561634

CENTRIFUGAL PUMP NT2/40-250U3.9D-W1

Drawing-No: 041-633

Ident-No.	Item.	Qty.	QU	Component	Drawing-No.
535699	0001	1,000	ST	BEARING BRACKET BG 2/360 NT W1+W2	041-633
12006	0006	1,000	ST	VOLUTE CASING BG 40-250 NT W1+W2	015-351
535658	0010	1,000	ST	IMPELLER, FIRST STAGE 2/40-250 NT GG-20	4611514315
516067	0011	1,000	ST	IMPELLER, SECOND STAGE 2/40+50-250 NT	4611514314
38992	0013	1,000	ST	CASING COVER BG 2/360-250 NT GG-25	030-163
632733	0034	1,000	ST	gasket 259/269,9X0,5 EWP210	WN431-40/03.00
12267	0055	8,000	ST	Socket head cap screw M12x40 8.8	WN301-51/09.91
12266	0057	8,000	ST	Socket head cap screw M10x35 8.8	WN301-51/09.91
43927	0090	4,000	ST	Rivet 2,4x4,8 AlMg2	M10 /022-959
37629	0095	1,000	ST	NAME PLATE 52X74 AL	WN392-03/07.96
16514	0122	1,000	ST	MECHANICAL SEAL MG1/30-G6-Q1Q1EGG	WN313-50/10.94
634348	0132	1,000	ST	SPACER SLEEVE 30X44X2,5 NT/2 GG-25	011-420
38974	0161	1,000	ST	STAGE CASING 2/40+50-250 NT GG-25	4611553301
38978	0162	1,000	ST	DIFFUSER 2/40+50-250 NT GG-20	4611552301
41138	0249	2,000	ST	HEXAGON SOCKET SCREW WITH CUP POINT	WN301-36/11.90
516083	0250	1,000	ST	SCREWED RING 2/40+50-250 NT ST37.0	4611562301
17813	0952	1,000	ST	PLASTIC COVER 39,8 KST	WN931-01/03.91
17808	0954	1,000	ST	PLASTIC COVER 65 KST	WN931-01/03.91
15894	0980	1,000	KG	Varnish blue, RAL 5017 AC-finish	
535700	0990	1,000	ST	SHAFT VG 2/360 NT W1+W2	041-633
550088	9999	1,000	ST	OPERATING INSTRUCTIONS NT	VM460.0002

Allweiler AG * Allweilerstrasse 1 * 78315 Radolfzell * Germany * Tel. +49(0)7732 86-0 * Fax +49(0)7732 86-552

Bill of Material: 535699

BEARING BRACKET BG 2/360 NT W1+W2
Drawing-No: 041-633

Ident-No.	Item.	Qty.	QU	Component	Drawing-No.
535697	0022	1,000	ST	SHAFT 2/360 NT U3D 1.4021	096-452
12065	0023	1,000	ST	BEARING BRACKET 360 GG-25	SCN /029-248
12070	0025	2,000	ST	BEARING COVER 360 NT GG-25	027-140
27840	0030	2,000	ST	GROOVE BALL BEARING 6306-2Z JC3	WN321-07/12.91
27903	0040	1,000	ST	GASKET 28X48X5 EPDM-KTSCHK	WN431-20/07.85
17873	0064	1,000	ST	BALANCE DISC FOR BALL BEARING 6306 K3	WN323-15/03.88
12094	0066	1,000	ST	HEXAGON NUT M20X1,5-17H	WN304-18/03.91
12314	0073	8,000	ST	Socket head cap screw M6x16 8.8	WN301-51/09.91
12100	0075	1,000	ST	Circlip 30x1,5 Fedst	WN312-01/03.91
12103	0076	1,000	ST	CIRCLIP 72X2,5 FEDST	WN312-02/12.91
23945	0077	1,000	ST	SPRING WASHER B20 FEDST	WN305-31/06.76
535691	0080	1,000	ST	KEY A8X7X36 X6CRNIMOTI17122	WN311-11/03.91
12112	0081	1,000	ST	KEY A8X7X28 X6CRNIMOTI17122	WN311-11/03.91
535700	0900	1,000	ST	SHAFT VG 2/360 NT W1+W2	041-633

Allweiler AG * Allweilerstrasse 1 * 78315 Radolfzell * Germany * Tel. +49(0)7732 86-0 * Fax +49(0)7732 86-552

Bill of Material: 12006

VOLUTE CASING BG 40-250 NT W1+W2

Drawing-No: 015-351

Ident-No.	Item.	Qty.	QU	Component	Drawing-No.
18909	0006	1,000	ST	VOLUTE CASING 40-250 NT GG-25	015-351
12268	0036	3,000	ST	Joint washer A14x18 Cu DIN7603	WN431-90/11.90
12262	0061	3,000	ST	Screw plug G1/4A St	WN302-40/07.96



Marelli Motori S.p.A.

PART OF THE  FKI GROUP OF COMPANIES

Via Sabbionara, 1
36071 Arzignano
Vicenza
Italy

DATENBLATT - TECHNICAL SPECIFICATION

Kunde Customer		Referenz Nr. Our Reference no.	
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MOTORTYP - MOTOR TYPE		A4C200LA2
NENNLEISTUNG - RATED POWER	KW	30
BETRIEBSART - DUTY TYPE		S1
NENNSPANNUNG - RATED VOLTAGE	V	400
FREQUENZ - FREQUENCY	Hz	50
NENNSTROM - NOMINAL CURRENT	A	54
NENNDREHZAHL - RATED SPEED	R.P.M.	2950
MOTORAUSFÜHRUNG-EXECUTION		T.E.F.C.
BAUFORM - SHAPE	IM	IM B3 (IM 1001)
SCHUTZART - PROTECTION DEGREE	IP	55
KÜHLART - COOLING SYSTEM	IC	411
MASSENTRÄGHEITSMOMENT - INERTIA ($J = PD^2 / 4$)	Kgm ²	0,165
UMGEBUNGSTEMPERATUR - AMBIENT TEMPERATURE	°C	40
ISOLATIONSKLASSE - INSULATION CLASS		F
AUSNUTZUNG NACH - TEMP.RISE CLASS		B
NORMEN- APPLICABLE STANDARDS		CEI EN 60034-1

		LAST - LOAD
		4/4
WIRKUNGSGRAD - EFFICIENCY	%	92,5
COS ϕ - POWER FACTOR		0,87
STROMVERLAUF BEI BLOCK. LÄUFER - LOCKED ROTOR CURRENT	p.u.	6,8
KIPPMOMENT -BREAK DOWN TORQUE	p.u.	2,9
ANLAUFMOMENT - STARTING TORQUE	p.u.	2,4

LAGERTYPEN - BEARINGS TYPE	A SEITE - D-END		6312-Z-C3
	B SEITE - N-END		6210-Z-C3
SCHMIERUNG - LUBRIFICATION	TYP - TYPE		-
	INTERVALL - INTERVAL	hr	-
DREHRICHTUNG - DIRECTION of ROTATION			BOTH
GERÄUSCHE - NOISE (no load operat. at 1m with tolerance 3 dB(A))		dB(A)	80
GEWICHT - WEIGHT		Kg	130
VIBRATIONSGRAD-VIBRATION LEVEL		IEC 34-14	STANDARD