

 Bornemann An ITT Brand Pumps and Systems www.bornemann.com		Screw Pump HC 147 - 36/1 / N		order no. / pos. OF 82401467 / 3,0 page: 1																																																																																																																																						
1.0 Project Data																																																																																																																																										
Item: revision	customer :		6	quantity :																																																																																																																																						
			7	delivery date :																																																																																																																																						
			8	customer-no. :																																																																																																																																						
			9	expert : Kenneth Kotzan																																																																																																																																						
			10	phone/fax : 05724/390-0 / -290																																																																																																																																						
	1	order-no. :	11	application : Oil / Mazut Pumping																																																																																																																																						
	2	order-date :	12	final destination : Georgia																																																																																																																																						
	3	project-no. :	13	application code :																																																																																																																																						
	4	position :	14	serial-no. :																																																																																																																																						
	5	project name : pumps for booster or pipeline	15	item-no. :																																																																																																																																						
	2.0 Performance Data																																																																																																																																									
	1/2	pumped liquid : oil, mazut,																																																																																																																																								
	1/3																																																																																																																																									
	<table border="1"> <thead> <tr> <th colspan="2">operating points</th> <th>1.</th> <th>2.</th> <th>3.</th> <th>guarantee</th> <th colspan="2">operating points</th> <th>1.</th> <th>2.</th> <th>3.</th> <th>guarantee</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>temperature (C°) :</td> <td>100,0</td> <td>5,0</td> <td></td> <td>50,0</td> <td>14</td> <td>capacity (m³/h) :</td> <td>56,90</td> <td>61,53</td> <td></td> <td>59,76</td> </tr> <tr> <td>5</td> <td>viscosity (mm²/s) :</td> <td>25,00</td> <td>80,00</td> <td></td> <td>50,00</td> <td>15</td> <td>suction pressure (barg) :</td> <td>1,00</td> <td>1,00</td> <td></td> <td>1,00</td> </tr> <tr> <td>6</td> <td>gravity (kg/dm³) :</td> <td>0,700</td> <td>0,980</td> <td></td> <td>0,850</td> <td>16</td> <td>discharge pressure (barg) :</td> <td>10,00</td> <td>10,00</td> <td></td> <td>10,00</td> </tr> <tr> <td>7</td> <td>vapour pressure (bara) :</td> <td></td> <td></td> <td></td> <td></td> <td>17</td> <td>diff. pressure (bar) :</td> <td>9,00</td> <td>9,00</td> <td></td> <td>9,00</td> </tr> <tr> <td>8</td> <td>gas content (%) :</td> <td></td> <td></td> <td></td> <td></td> <td>18</td> <td>speed (1/min-) :</td> <td>1450</td> <td>1450</td> <td></td> <td>1450</td> </tr> <tr> <td>9</td> <td>solid content (%) :</td> <td></td> <td></td> <td></td> <td></td> <td>19</td> <td>shaft power (kW) :</td> <td>22,36</td> <td>24,29</td> <td></td> <td>23,40</td> </tr> <tr> <td>10</td> <td>particle size (mm) :</td> <td></td> <td></td> <td></td> <td></td> <td>20</td> <td>motor power (kW) :</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11</td> <td>pH-value :</td> <td></td> <td></td> <td></td> <td></td> <td>21</td> <td>NPSH required (m) :</td> <td>1,77</td> <td>1,82</td> <td></td> <td>1,80</td> </tr> <tr> <td>12</td> <td>condition (liqu./gas.) :</td> <td colspan="4">liquid</td> <td>22</td> <td>NPSH available (m) :</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>13</td> <td>remarks :</td> <td colspan="10"></td> </tr> </tbody> </table>						operating points		1.	2.	3.	guarantee	operating points		1.	2.	3.	guarantee	4	temperature (C°) :	100,0	5,0		50,0	14	capacity (m³/h) :	56,90	61,53		59,76	5	viscosity (mm²/s) :	25,00	80,00		50,00	15	suction pressure (barg) :	1,00	1,00		1,00	6	gravity (kg/dm³) :	0,700	0,980		0,850	16	discharge pressure (barg) :	10,00	10,00		10,00	7	vapour pressure (bara) :					17	diff. pressure (bar) :	9,00	9,00		9,00	8	gas content (%) :					18	speed (1/min-) :	1450	1450		1450	9	solid content (%) :					19	shaft power (kW) :	22,36	24,29		23,40	10	particle size (mm) :					20	motor power (kW) :					11	pH-value :					21	NPSH required (m) :	1,77	1,82		1,80	12	condition (liqu./gas.) :	liquid				22	NPSH available (m) :					13	remarks :										
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3.0 Material Execution																																																																																																																																										
1	pump casing :	EN-GJS-400-18-LT s.t ASTM A536		7	bearing housing :	EN-GJS-400-18-LT s.t ASTM A536																																																																																																																																				
2	screws :	EN-GJS-400-15 s. to AISI 60-40-18		8	sealing housing :	1.4057 sim. to AISI 431																																																																																																																																				
3	shafts :	1.4542 sim. to AISI 630		9	flat gaskets :	fiber composition, non asbestos																																																																																																																																				
4	liner :	-		10	o-rings medium wett. :	FKM																																																																																																																																				
5	intermediate flange :	-		11	non med. wetted seals :	NBR																																																																																																																																				
6	remarks :																																																																																																																																									
4.0 Shaft Sealing																																																																																																																																										
1	construction / function :	Mechanical seal, single acting		6	API-plan :																																																																																																																																					
2	manufacturer :	EagleBurgmann		7	pipng :																																																																																																																																					
3	type :	M7-G13		8	pipng execution :																																																																																																																																					
4	material code :	SAVGG		9	quench / barrier fluid :																																																																																																																																					
5	remarks :																																																																																																																																									
5.0 Bypass / Heating / Design / Bearings																																																																																																																																										
1	bypass :	Internal, without handwheel		9	heating fluid data :	0,0 barg 0,000 °C																																																																																																																																				
2	setting point :	10,0 bar		10	bearing life time :	h																																																																																																																																				
3	max. suction pressure :	6 barg		11	additional execut. 1 :																																																																																																																																					
4	casing design :	SS:16.0 bar g/DS: 24.3 bar g,150°C		12	additional execut. 2 :																																																																																																																																					
5	design data heating :			13	measuring points 1 :	1x G1/2" for PT-100 at pump casing																																																																																																																																				
6	heating :			14	measuring points 2 :	4x G1/2" for PT-100 at bearing casing																																																																																																																																				
7	heating fluid :			15	----- :																																																																																																																																					
8	remarks :																																																																																																																																									
6.0 Flanges / Connections																																																																																																																																										
		<u>rule</u>	<u>size</u>	<u>press. rate</u>	<u>position</u>																																																																																																																																					
1	suction :	DIN EN 1092-2/B1	DN 200	PN 16	left																																																																																																																																					
2	discharge :	DIN EN 1092-2/B1	DN 200	PN 16	top																																																																																																																																					
3	heating :																																																																																																																																									
4	drain :	DIN ISO 228-1	G 1"		bottom																																																																																																																																					
5	quench :																																																																																																																																									
6	cooling :																																																																																																																																									
7	flange options :																																																																																																																																									
8	remarks :																																																																																																																																									
issued: Koch / 09.10.2024 checked: Strottmanns / 09.10.2024 revised: abelf / 15.10.2024 rev.: 1																																																																																																																																										

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7.0 Installation / Rotation / Name Plate

1	installation	: horizontal	5	rotation	: cw
2	location	: Outdoor, covered -20.0 °C...45.0 °C	6	pos. of drive shaft	: left
3	area classification	: ATEX Zone 1 IIB T3	7/8	name plate	: English / stainless steel
4	remarks	: marked: -/Ex II 2G h IIB T3 Gb, operation acc. to data sheet and ATEX add.instructions			

8.0 Accessories

1	base plate	:	9	maker coupling	:
2	executioncode	:	10	coupling type	:
3	option base plate 1	:	11	coupling guard	:
4	option base plate 2	:	12	cover for drive	:
5	drip pan	:	13	instruments/options	:
6	mounting option 1	:	14	spare parts	:
7	mounting option 2	:	15	electrical wiring	:
8	remarks	:			:

9.0 Drive

1	drive system	:	11	frequency (Hz)	:
2	type	:	12	protection	:
3	manufacturer	:	13	explosion proof	:
4/5	size/ mounting form	:	14	thermal class	:
6	start	:	15	certificate	:
7	power (kW)	:	16	supplied by	:
8	speed (1/min-)	:	17	assembly	:
9	voltage (V)	:	18		:
10	remarks	:			:

10.0 Painting / Conservation

1	painting	: RAL 5010, Gentian blue (standard)	5	intermediate coat	: -
2	surface preparation	: Acc. to QMAE PR-022/2 (standard)	6	remarks	: Acc. to QMAE PR-022/2 (standard)
3	primer coat	: Acc. to QMAE PR-022/2 (standard)	7	preservation	: 6 Months (QMA PR-203)
4	remarks	:			:

11.0 Mill Certs / Testing

1	casing	: EN 10204-3.1	11	liner	: -																																																
2	shafts	: EN 10204-3.1	12	mechanical seal	: -																																																
3	screws	: EN 10204-3.1	13	bearing housing	: -																																																
4	additional parts	:																																																			
<table><tr><th>Testing</th><th>yes/no</th><th>according to</th><th>by</th><th>pressure</th><th>test medium</th></tr><tr><td>5</td><td>hydrostat. press. test</td><td>: yes</td><td>QMP QS-002</td><td>ITT-B (EN 10204-2.2)</td><td>1,5 x pD</td><td>water</td></tr><tr><td>6</td><td>performance test</td><td>: yes</td><td>QMP QS-106</td><td>ITT-B (EN 10204-2.2)</td><td></td><td>water</td></tr><tr><td>7</td><td>NPSH-test</td><td>: no</td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td>noise level test</td><td>: no</td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td>vibration test</td><td>: no</td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td>remarks</td><td>:</td><td></td><td></td><td></td><td></td></tr></table>						Testing	yes/no	according to	by	pressure	test medium	5	hydrostat. press. test	: yes	QMP QS-002	ITT-B (EN 10204-2.2)	1,5 x pD	water	6	performance test	: yes	QMP QS-106	ITT-B (EN 10204-2.2)		water	7	NPSH-test	: no					8	noise level test	: no					9	vibration test	: no					10	remarks	:				
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10	remarks	:																																																			

12.0 Documentation

1	language	: English	6	operation manual	: 1-fold
2	hydrostat. press. test	: 1-fold	7	mill certs	: 1-fold
3	performance test	: 1-fold	8	dimensional drawing	: 1-fold
4	documents to	: noble-mariner@shipprovide.com			:
5	remarks	: Documentation 1-fold per pump			:

13.0 Weights / Packing

1	pump	: kg	3	accessories	: kg	5	total gross	: kg
2	base plate	: kg	4	total net	: kg	6	packing	: wooden box

14.0 Remarks

1	- acc. to order 81600394
	to 12) Certificate of Conformance, to PO
	to 12) Pump Operating and Maintenance manual
	to 12) Standard General Arrangement Drawing (incl. Nozzle/Flange Loading)
	to 12) Pump Cross Sectional Drawing with Parts List
	to 12) Pump Data Sheet (Manufacturer Form)

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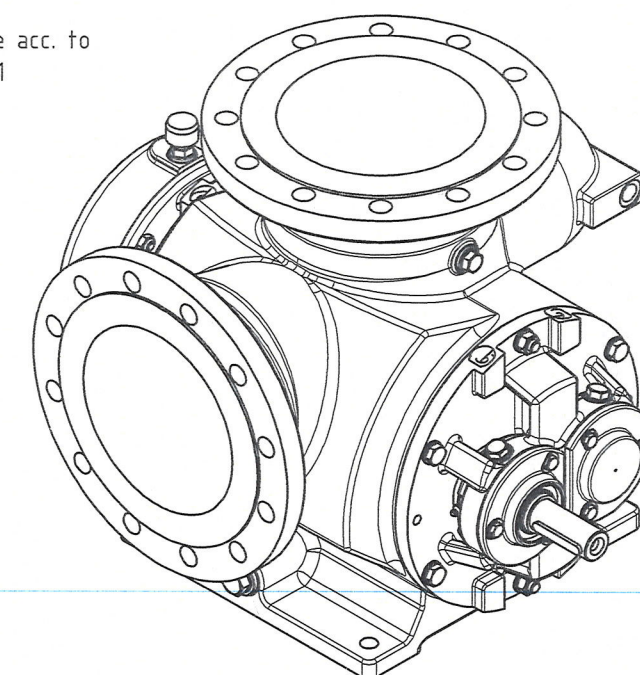
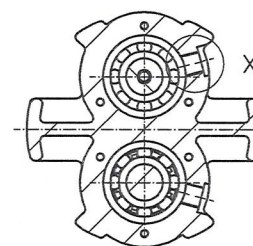
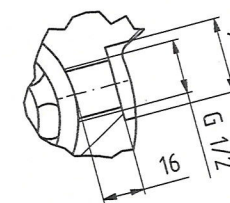
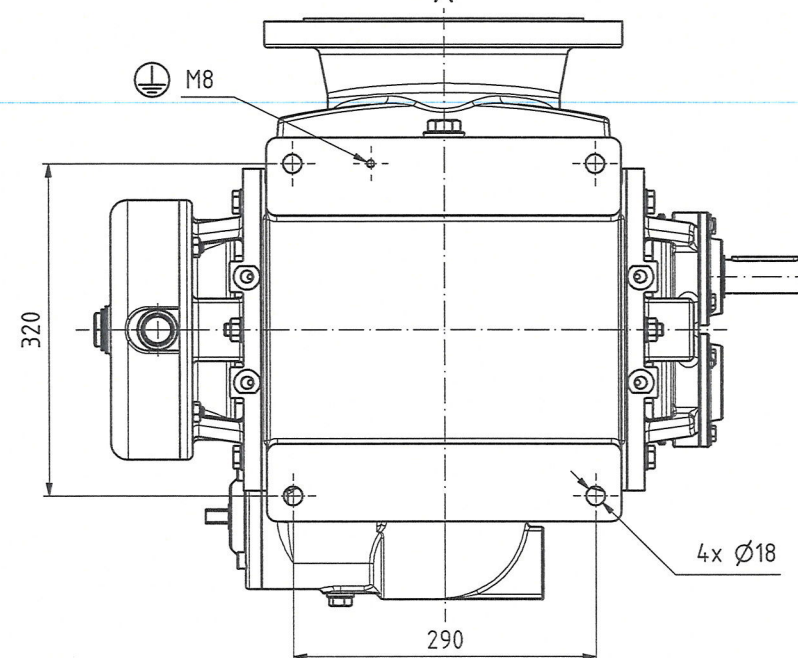
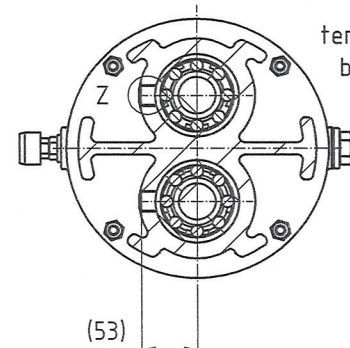
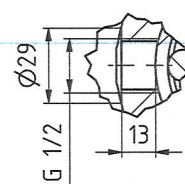
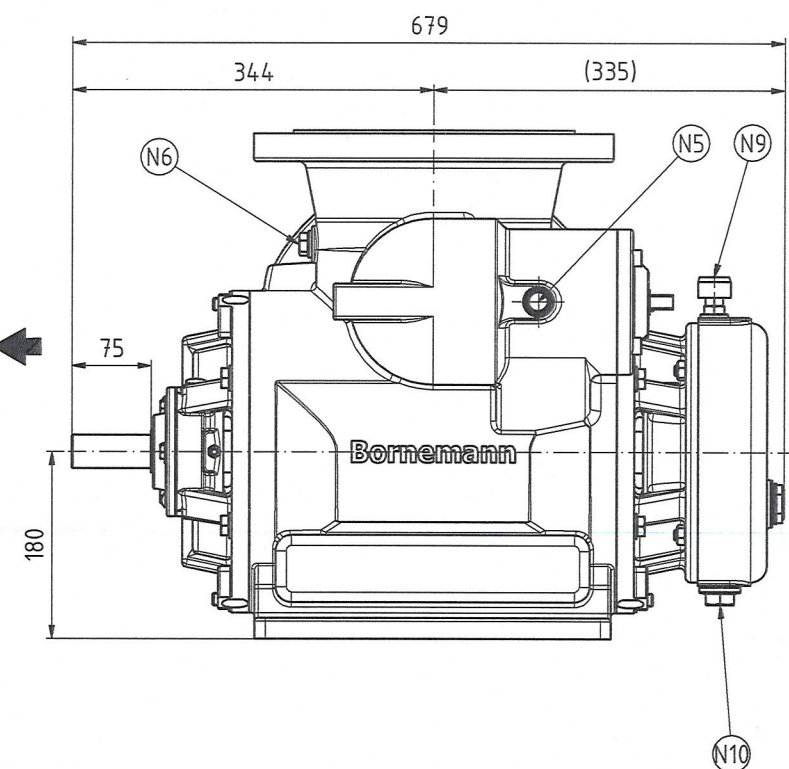
to 12) Country of Origin - by Bornemann

- Temperature monitoring for pump casing and bearing housing is mandatory (see ATEX additional instructions).

- Attention:

Due to the increased differential pressure compared to original delivery, the shaft power has increased, as well. The original installed drive of 24kW does not have any reserve left.

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				casing spherical graphite iron	
P1	Max. all. inlet pressure	6 bar @ 20°C		Allowable Nozzle Loads	
N1	Temperature gauge connection 2	G1/2		N1  Mx My Fx Fy	
N11	Temperature gauge connection 1	G1/2		N11  Mx My Fx Fy	
N10	Oil drain	G1			
N9	Oil inlet	G1/2			
N8	Drip pan drain	---			
N7	Heating connection			Fx [N] 2600 2600	
N6	Pressure gauge connection	G1/2		Fy [N] 2600 2600	
N5	Vacuum gauge connection	G1/2		Fz [N] 2600 2600	
N4	Casing drain discharge	---		Mx [Nm] 14.00 14.00	
N3	Casing drain suction	G1		My [Nm] 14.00 14.00	
N2	Discharge flange	DN200 PN16 DIN EN 1092-2/B1		Mz [Nm] 14.00 14.00	
N1	Suction flange	DN200 PN16 DIN EN 1092-2/B1		Drawn 03.05.2018 hanschen	
Gen. Tolerance DIN ISO 2768- vK		Scale 1:5	Mass 216 kg	Checked 04.05.2018 Blaß	
		Screw Pump HC147		A2-Plot 03.05.2018 14.16	
ITT Bormann				CAD-ID 1511P000012.iam	
				1511G000010	
				Drawing No.	Rev. 00