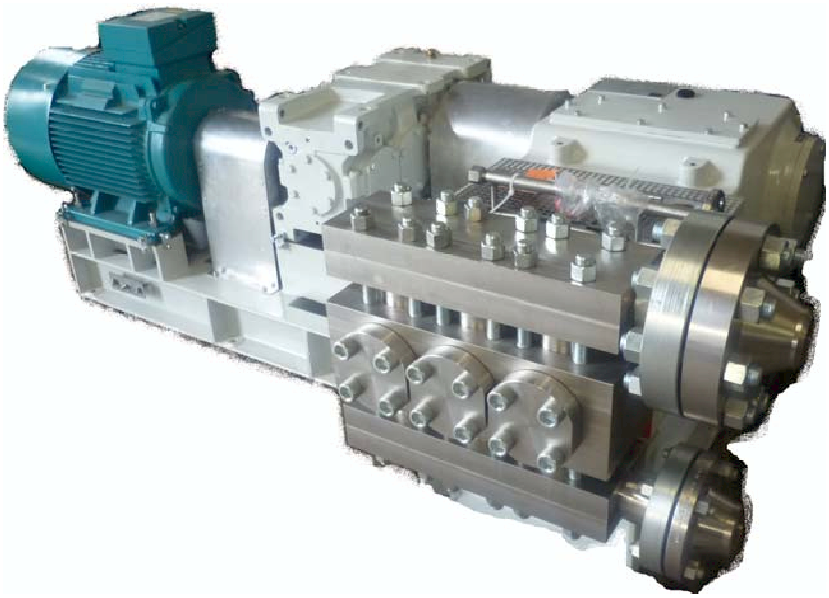
INSTALLATION, OPERATION & MAINTENANCE MANUAL

CLIENTE *CUSTOMER - CLIENT*	
IMPIANTO *PLANT - INSTALLATION*	
LOCALITA' *SITE - LOCALITE'*	**NIGERIA**
PROGETTO *PROJECT - PROJET*	
SERVIZIO *SERVICE - SERVICE*	**SLURRY FEEDING**
SIGLA *ITEM - ITEM*	**63P3 A/B**
TIPO POMPA *PUMP TYPE - POMPE TYPE*	**STP3 95x120**
ORDINE *PURCH ORDER - COMMANDE*	**1200511**
DATA *DATE - DATE*	**21/06/2012**
COMMESSA *WORK ORDER - BON DE TRAVAIL*	**2F11**



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1.0 GENERAL RULES

- The unit must be installed in a safe area, with the guarantee of the necessary escape ways and of the repair of risks deriving from the execution of other operations.
- Preserve this manual for future references.
- It is forbidden the use of the machine outside the field of employment.
- For every doubt or employ which are not contemplated in this manual, you are invited to contact before installation our after-sales service department.
- For any communication always mention the machine model, the serial and job number.
- Exclusively use original spares.

2.0 DESCRIPTION OF THE MACHINE

The pumping unit consists of:

- Horizontal reciprocating pump with plungers series STP3 95 x 120, having technical features as per our enclosed specification.
- Gear reducer, "SEF" mod. RXP2/808/B/12/ECE/N/M1
  Ratio: 1:12
- Electric motor, "BROOK CROMPTON" mod. AU-DF-250M
  55kW - 415V - 4poles - 3ph - 50Hz
- Exchanger "SESINO" mod. T60B2

- Rotative pump, "MORGAN" mod. PQ15
- Couplings, "EUROTRAS" mod. E350P - E180P - E70S
- Base common to the unit.

3.0 DATA SHEET

COMPANY : BALLESTRA	JOB/ OFFER	Revision	
COUNTRY: NIGERIA	122027	0	
AREA:			
PLANT: SABIZ 2F11	**BALLESTRA JOB: 2F11**		
	Sheet 1 / of 1	Compiled S. BELLEI	Date 24/02/11

RECIPROCATING PUMP DATA SHEET

1	SERVICE: Slurry feeding				ITEM N° **- 63P3 A/B**		
2	OPERATION : **Continuous**		discontinous		N° OF UNITS (main/standby) **1 / 1**		
3	PUMP MFR : SABI POMPE E IMPIANTI S.R.L.				PURCHASE ORDER N°		
4	PUMP TYPE : STP 3 - 95 x 120						
5	DRIVER TYPE ELECTRIC MOTOR				GENERAL SPECIFICATION : API 674		
6	**GENERAL**						
7	N° MOTOR DRIVEN		1/1		LOCATION		Indoor
8	PUMP ITEM N°		63P3 A/B		RANGE AMBIENT TEMPS (Min/Max) °C		**(TO BE DEFINED)**
9	**OPERATING CONDITIONS**				**LIQUID**		
10	CAPACITY	m^3/h	**3,6 / 17,95 (20-100%)**		TYPE / NAME	**SLURRY DETERGENTE**	
11	DISCHARGE PRESS	BARA	**74**		PUMPING TEMP. (Normal/max/min) °C		**60/85**
12	SUCTION PRESS. Min/Max	BARA	**4**		SPEC.GRAVITY(Normal/max/min)		**1,3**
13	DIFFERENTIAL PRESSURE	BAR	**70**		SPEC. HEAT	Cp (kJ/kg °C)	
	ACCELERATION HEAD (ha)	m	**To be defined**				
14	NPSH AVAILABE (without acc.head)		**m**	**>7**	VISCOSITY (min/max)	cp	**10.000**
15	**PERFORMANCE**				**ELECTRIC DRIVER (By Ballestra)**		
16	RATED CAPACITY (3)	m^3/h	**3,6 / 17,95 (20-100%)**		ELECTRICAL AREA CLASS (Group/zone)		
17	NPSH REQUIRED	m	**4,5**		MANUFACTURER		
18	PISTON SPEED	m/sec	**0,48**		TYPE	B3	
19	DISPLACEMENT	m^3/h	**17,95**		CONSTANT SPEED		**No**
20	VOLUMETRIC EFF. (%)		**95**		POWER (2)	KW	**55**
21	MECHANICAL EFF. (%)		**85**		GIRI	RPM	**1470**
22	Kw@ MAXIMUM VISC.		**Norm. 45 / Max 48**		PHASE	**3**	
23	RELIEF VALVE SETTING	BAR G	**77**		VOLTS	**415**	
24	MAXIMUM ALLOWABLE SPEED	(RPM)	**400**		HERTZ	**50**	
25	MINIMUM ALLOWABLE SPEED	(RPM)	**24 (Without force lubr.)**		SERVICE FACTOR	**1**	
26	PINION SHAFT	(RPM)	**123 Max 50Hz**		EXECUTION		
27					TREATMENT	**TROPICALIZATION REQD**	
28	**INSPECTION**				**SHOP TESTS**		
29	COMPLANCE WITH INSPECTION CHECK LIST			**X**	HYDROSTATIC		**X**
30	CERTIFICATION OF MATERIALS			**X**	PERFORMANCE		**X**
31	FINAL ASSEMBLY CLEARANCES			**X**	NPSH		
32	ULTRASONIC TEST				OTHERS (IF REQUIRED)		
33	**MATERIALS**						
34	**PUMP LIQUID END**				**OTHER PURCHASE REQUIREMENTS**		
35	FRAME	**CAST IRON UNI G 25**			RELIEF VALVE SETTING (Barg)		**77**
36	PUMP BODY	**C.S.**			MAXIMUM SOUND LEVEL (Dba)		**82 at 1mt**
37	PLUNGER	**AISI 316 + TUNGST. COATED**			PACKING COLLECTION CHAMBER		**Yes**
38	DIAPHRAGM				**POWER FRAME**		
39	PISTON RING	**PTFE- FILLED**			MAXIMUM FRAME RATING (KW)		**100 at 500 rpm**
40	PISTON ROD	**AISI 420**			MAXIMUM PRESSURE RATING (BARg)		**100**
41	VALVES/VALVE SEATS	**C.S. + STELL.**			CRANK SHAFT MATERIAL		**ALLOY C.S.**
42	GLAND	**AISI 304**			N° OF MAIN BEARINGS		**2**
43	THROAT BUSHING	**AISI 304**			TYPE OF MAIN BEARING		**ROLLER**
44	PACKING	**SOFT BRAID + "V Chevron"**			GEAR SERVICE FACTOR		**>2**
45	LANTERN RING	**AISI 304**			POWER END LUBRIFICATION **(3)**		**Splash**
46	BOLTING	**8G GALVANIZED**			**NOZZLES**	**SIZE**	**UNI RAT.**
47	TYPE	STP3) Triplex pump single acting			SUCTION	**4"**	**ANSI 150 RF**
48	N° OF CYLINDER	3			DISCHARGE	**3"**	**ANSI 600 LF**
49	**GEAR REDUCER**				**NOTES:**		
50	MANUFACTURER	GSM					
51	MODEL	RXP2_808_1:12			**(2) Name plate power under inverter**		
52	TYPE	PARALLEL AXES			**(3) Forced lubrification for running**		
53	SERVICE FACTOR	>2 ON MAX ABS. POWER			**less 24 Rpm**		

N.B. APPLICABLE **(X)**

REV.	Data	DESCRIZIONE	COMPIL.	VERIF.	APPROVV
0	24/02/12	EMESSO PER OFFERTA	*A.Bellei*		

desmet ballestra	COMPANY : BALLESTRA	JOB/ OFFER	Revision	
	COUNTRY: NIGERIA	122027	0	
	AREA:			
	PLANT: SABIZ 2F11	**BALLESTRA JOB: 2F11**		
		Sheet 2 / of 2	Compiled S. BELLEI	Date 24/02/11

RECIPROCATING PUMP DATA SHEET (MOTOR)

49	TAGS: MOTORS		QUANTITY N° 1/1			
50	PURPOSE:					
51						
52	**DESIGN DATA**					
53						
54						
55	MOTOR DATA	Rated power:	55 KW		N° Poles:	4
56		Rated voltage (Volt)	415	Freq.	50 Hz	±2%
57		Shape:	B3			
10		Duty:	X	**Continuous**		Non continuous
11		Start-up:		**Direct**		**Others**
12		**Cooling**	IC 411			
13		**Lubrification**	Grease			
14		**Execution**	Enclusure: IP 55			
15		**and degree**	Terminal boxes			
16		**of protection**				
17	SUPPLY DATA	Operation voltage (Ue)	415 Volt		**±5%**	
18		**Frequency:**	**50 Hz**		**± 2%**	
19		**Natural point:**				
20		**Min.voltage on terminate at start-up:**				
21						
22	DATA OF DRIVEN MACHINE	**RECIPROCATING TRIPLEX PUMP**				
23		**SINGLE ACTING (COUPLE FLUCTUATION)**			**-13 / + 9 %**	
24						
25						
26						
27	**PERFORMANCE AND CONSTRUCTION DATA**					
28						
29	MFR and construction type:					
30	Rated current:	A				
31	Rated torque:	Nm				
32						
33	**Notes:**					
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
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45						
46						

NOTE:

4.0 DRAWINGS

POS.	FLANGE DESCRIPTION	CONNECTIONS
A	SUCTION PUMP	4" ANSI 150 RF (WN sch.40)
B	DISCHARGE PUMP	3" ANSI 600 LF/LM (WN sch.80)
C	INLET WATER FLUSHING - INLET/OUTLET WATER EXCHANGER	1/2" ANSI 150 RF
D	OUTLET WATER FLUSHING	Tubing: N°3 10x7

FLUSHING FLUID:
Water Temperature: 5 - 40 °C
Pressure: 3 - 7 barg / Design 10 barg
Consumption: 100-150 lt/h

FORCED LUBRICATION			
OIL	Capacity	[lt/min]	10
	Pressure (Ex / Design)	[bar]	3,5 / 10
WATER	ΔTmax	[°C]	6
	Consumption	[lt/h]	~ 330
Power Motor: 6 poles, 400 V, 50 Hz		[kw]	0,55

ELECTRIC MOTOR:
Manufacturer: BROOK CROMPTON
Type: AU-DF-250M
P: 55 kw, 415V, 4 poles, 3 ph, 50 Hz

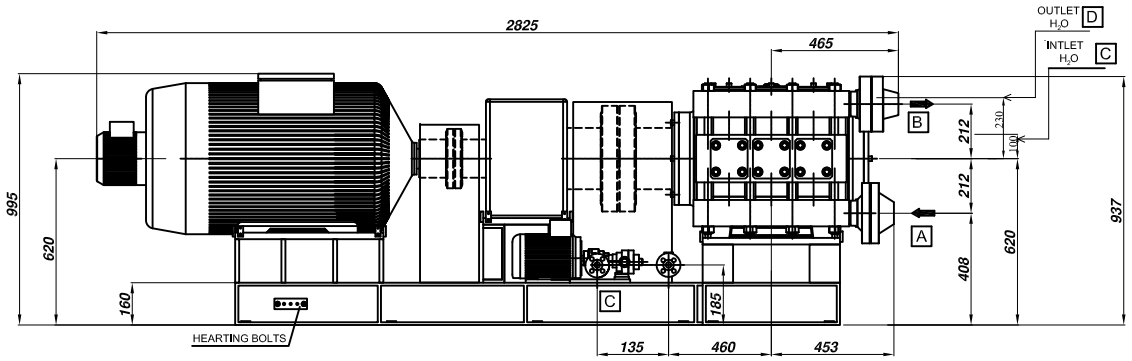
ELECTRIC MOTOR - FORCED LUBRICATION:
Manufacturer: BROOK CROMPTON
Type: B-DA80MB
P: 0,55 kw, 415V, 6 poles, 3 ph, 50 Hz

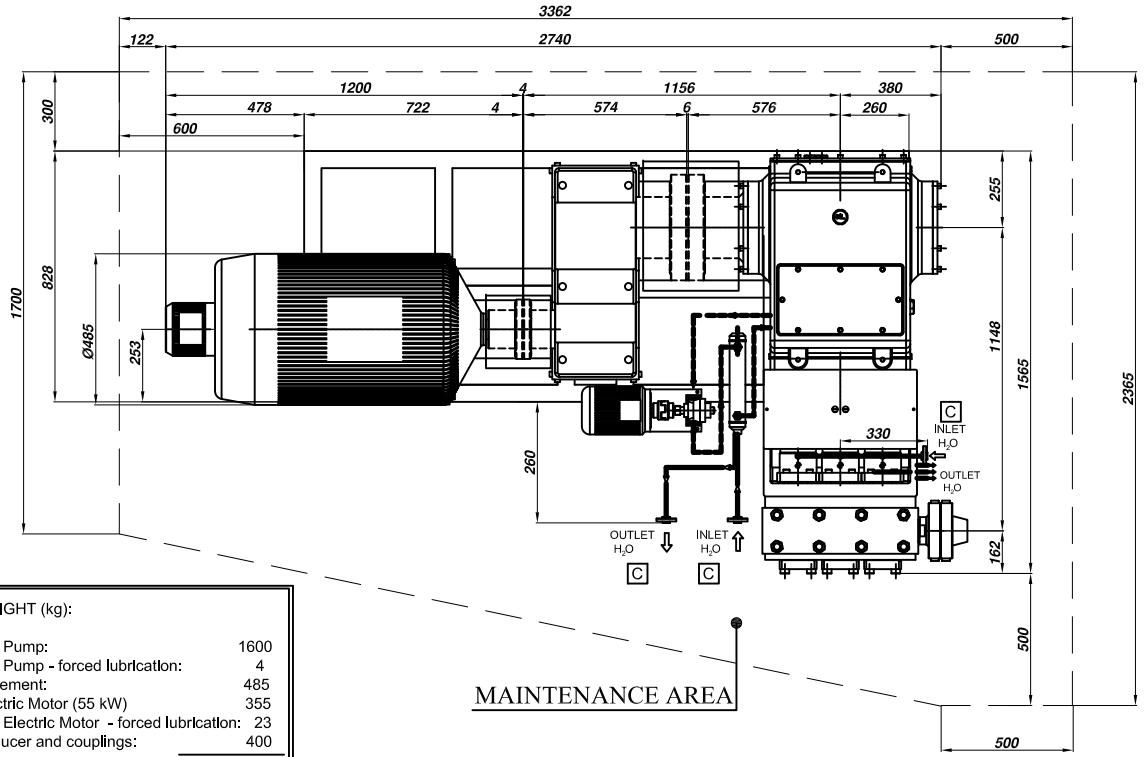
HEATING EXCHANGER:
Manufacturer: SESINO
Type: T60B2

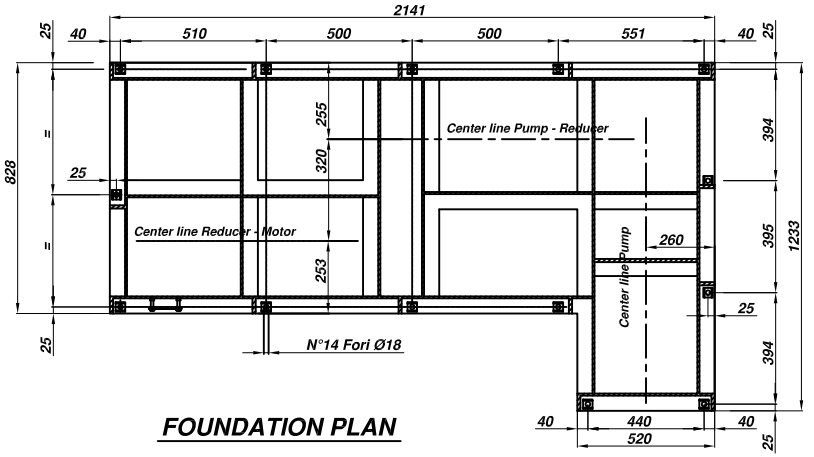
PUMP - FORCED LUBRICATION:
Manufacturer: MORGAN
Type: PQ15

COUPLINGS:
Manufactured: EUROTRAS
Slow: E350P
Fast: E180P
Forced lubrication: E70S

REDUCER:
Manufacturer: SEF
Type: RXP2 808 / B / 12 / ECE / N / M1
Ratio: 1 : 12







FOUNDATION PLAN

WEIGHT (kg):	
N°1 Pump:	1600
N°1 Pump - forced lubrication:	4
Basement:	485
Electric Motor (55 kW)	355
N°1 Electric Motor - forced lubrication:	23
Reducer and couplings:	400
TOTAL WEIGHT:	2867 Kg

REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
0	ISSUED FOR COSTRUCTION		

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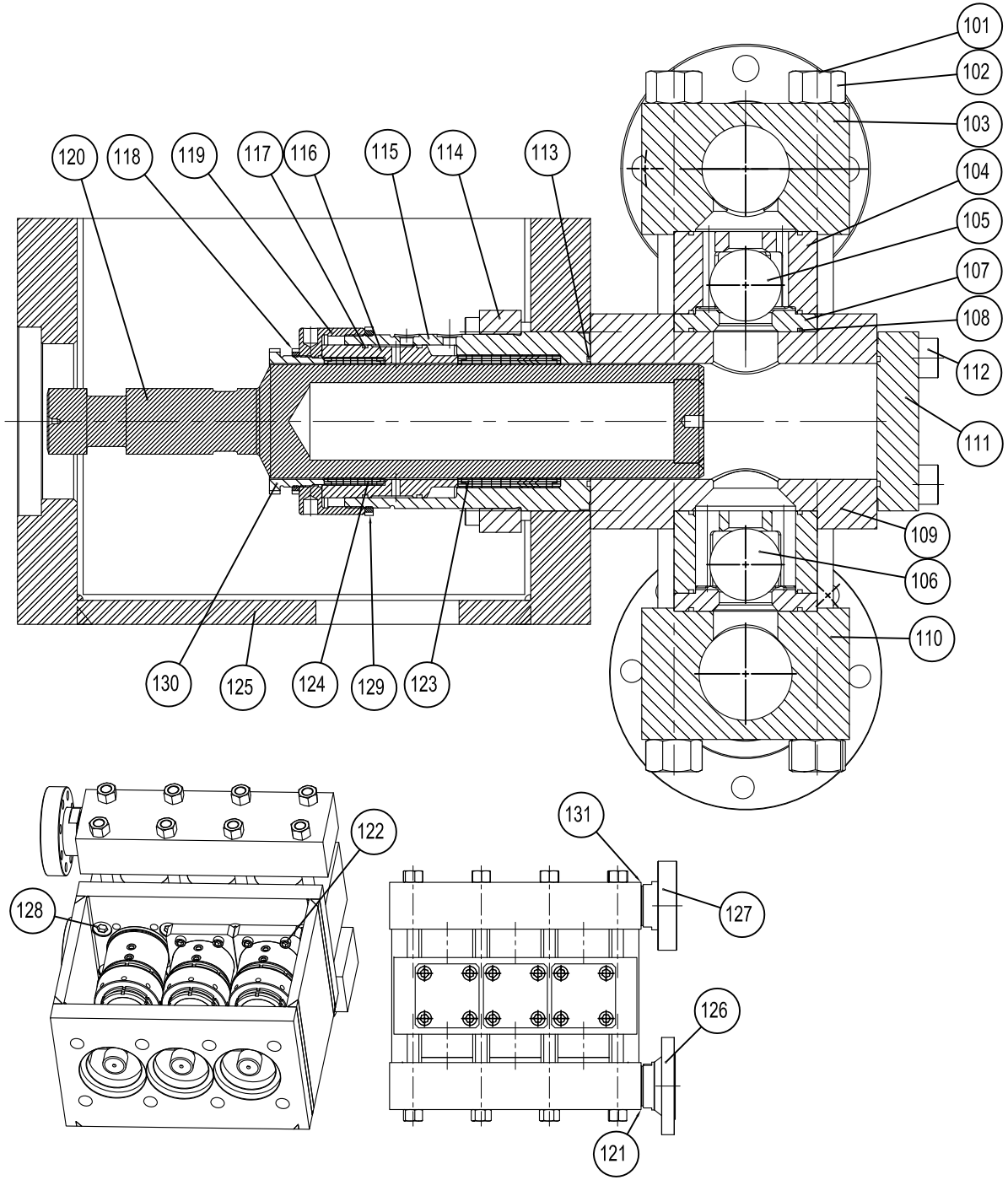
DRAWING Nr. / Disegno Nr.: 3239-BD-000-LAY
CUSTOMER Nr. / Nr. Cliente: -

JOB Commessa	2F11	SHEET Foglio	1 / 1
PLANT Impianto		SHEET REVISION Revisione Foglio	0
TITLE Titolo	Item Pump: 63 P3 A/B LAYOUT STP3 95 x 120	SCALE Scala	-
		SECTION Sezione	-



Pos.	Descrizione	Description	Q.	Material	Dwg./Code
131	GUARNIZIONE OR	OR GASKET	1	Nitrile	OR 4325
130	GHIERA DI FERMO	SAFETY RING NUT	6	AISI 304	3239-BD-130-K04
129	GHIERA DI FERMO	SAFETY RING NUT	3	AISI 304	3239-BD-129-K04
128	VITE TCEI	ALLEN SCREW	8	8G Galv.	M30 x 3 x 60
127	FLANGIA PREMENTE	DISCHARGE FLANGE	1	A 105 Galv.	3239-BD-127-1/2-N05
126	FLANGIA ASPIRANTE	SUCTION FLANGE	1	A 105 Galv.	3239-BD-126-1/2-N05
125	DISTANZIALE	SPACER	1	Fe 410	3239-BD-125-N05
124	PACCO SECONDARIO	REAR PACKING	3	PTFE+Crg.+AISI 304	3239-BD-124-XXX
123	PACCO TENUTA PRINCIPALE	MEAN SEALING PACKING	3	PTFE+Crg.+AISI 304	3239-BD-123-XXX
122	VITE TCEI	ALLEN SCREW	12	8G Galv.	M16 x 115
121	GUARNIZIONE OR	OR GASKET	1	Nitrile	OR 4325
120	PISTONE	PLUNGER	3	AISI 316L +Carb. Tung.	3239-BD-120-K16
119	GHIERA PREMISTOPPA	PACKING RING NUT	3	AISI 304	3239-BD-119-K04
118	GHIERA TENUTA SECONDARIA	SECONDARY RING NUT	3	AISI 304	3239-BD-118-K04
117	GUARNIZIONE OR	OR GASKET	6	Nitrile	OR 3475
116	LANTERNA TENUTA	PACKING LANTERN	3	AISI 304	3239-BD-116-K04
115	CILINDRO IDRAULICO	HYDRALIC CILINDER	3	AISI 304	3239-BD-115-K04
114	FLANGIA CILINDRO	CYLINDER FLANGE	3	A 105 Galv.	3239-BD-114-N05
113	GUARNIZIONE	GASKET	6	PTFE + Crg.	3239-BD-113-X14
112	VITE TCEI	ALEN SCREW	12	8G Galv.	M22 X 60
111	FLANGIA PISTONI	PLUNGER FLANGE	3	A 105 Galv.	3239-BD-111-N05
110	COLLETTORE ASPIRANTE	SUCTION MANIFOLD	1	A 105 Galv.	3239-BD-110-N05
109	CORPO VALVOLE	VALVE BODY	1	A 105 Galv.	3239-BD-109-N05
108	GUARNIZIONE OR	OR GASKET	18	Nitrile	OR 4350
107	SEDE VALVOLA	VALVE SEAT	6	AISI 304+Stell.	3239-BD-107-K04
106	VALVOLE ASPIRANTI	SUCTION VALVES	6	AISI 420	Diam. 60 mm
105	VALVOLE PREMENTI	DISCHARGE VALVES	6	AISI 420	Diam. 60 mm
104	LANTERNA VALVOLE	VALVES LANTERN	6	AISI 304	3239-BD-104-K04
103	COLLETTORE MANDATA	DISCHARGE MANIFOLD	1	A 105 Galv.	3239-BD-103-N05
102	DADO M27	NUT M27	16	A 193 Gr.4	M27 - ISO 4034
101	PRIGIONIERO	TIE ROD	16	A 193 B7 Galv.	M27 X 3 X 240

REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
0	ISSUED FOR CONSTRUCTION		26/03/'12

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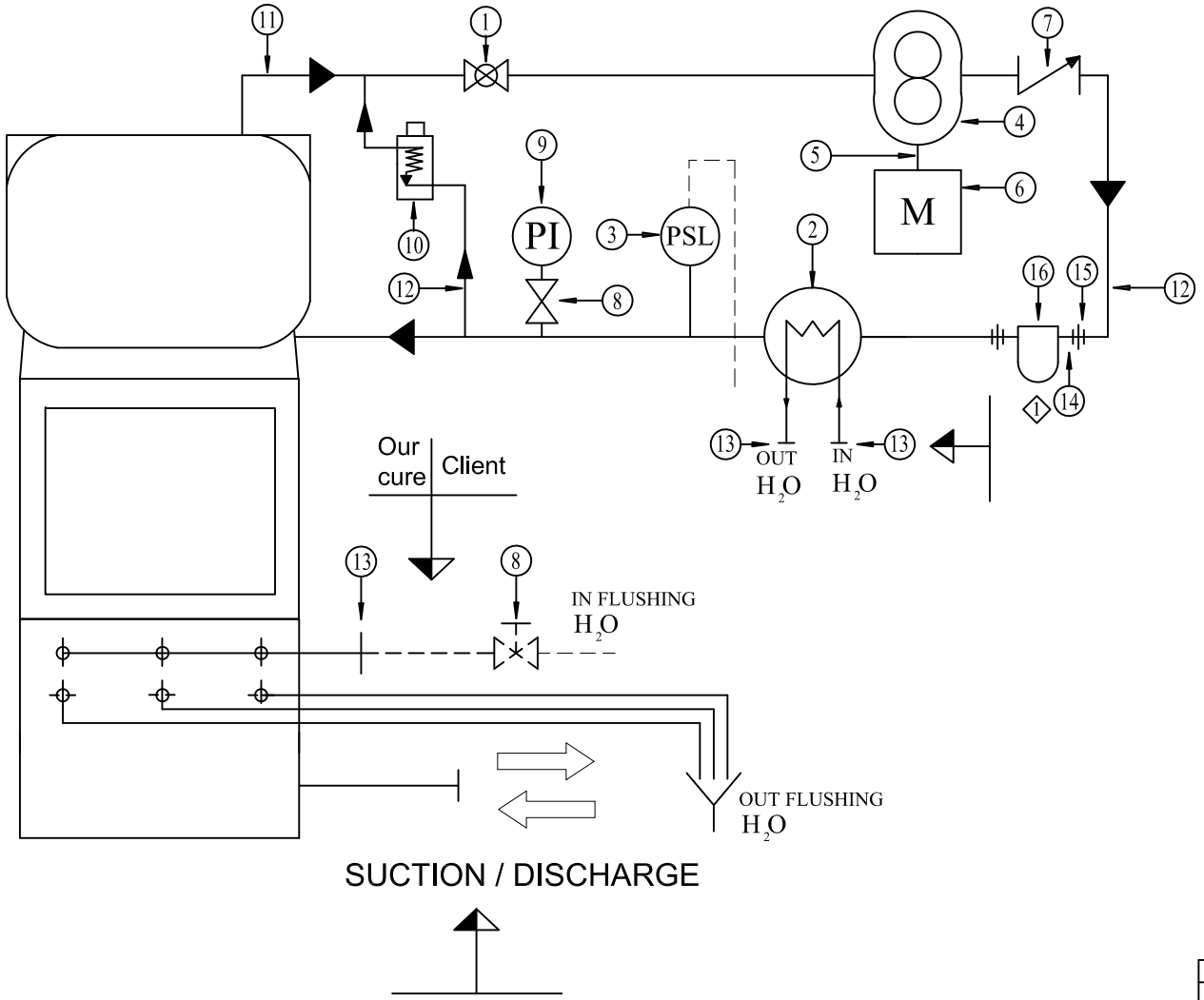
DRAWING Nr. / Disegno Nr.: 3239-BD-000-SEZ
CUSTOMER Nr. / Nr. Cliente: -

JOB Commessa	2F11	SHEET Foglio	1 / 1
PLANT Impianto		SHEET REVISION Revisione Foglio	0
TITLE Titolo	SLURRY FEEDING - Item Pump: 63 P3 A / B HYDRAULIC SECTION	SCALE Scala	-
		SECTION Sezione	-



Pos.	DESCRIPTION	Material	Note
1	VALVE	Stainless Steel	DN 1" PN 800 lbs.
2	HEAT EXCHANGER	Body: Carbon Steel Pipe: Stainless Steel	Manufacturer: SESINO Type: T60CB2
3	LOW PRESSURE SWITCH ALARM	Stainless Steel (wedded parts)	Set: 1,5 bar
4	GEAR PUMP	Body: cast iron Internal: stainless steel	Manufacturer: MORGAN Type: PQ15PBY
5	ELASTIC COUPLING	Cast iron	Manufacturer: EUROTRAS Type:
6	DRIVER	-	Manufacturer: ABB Type: M2QA 80M6B - B3 Performance: 0,55 kw, 50 Hz, 6 poles, 3 ph - IP55
7	CHECK VALVE	Stainless Steel	DN 3/4" PN 800 lbs.
8	NEEDLE VALVE	Stainless Steel	1/2" NPT-F
9	PRESSURE INDICATOR	Stainless Steel	Ø 100 Scale: 0 - 10 bar Connection: 1/2" NPT
10	SELF REGULATION VALVE	Stainless Steel	DN 1" PN 800 lbs.
11	PIPE	AISI 304	1" set. 4 barg
12	PIPE	AISI 304	3/4" sch.40
13	FLANGE	AISI 304	1/2" ANSI 150 RF
14	PIPE UNION	Carbon Steel	3/4" FF
15	REDUCTION	Carbon Steel	3/4" x 1/2" - BSP THREADED
16	FILTER	Cast Iron	1/2" x 1/2" - BSP THREADED

PUMP GEAR			
OIL	Capacity	[lt/min]	10
	Pressure (Ex / Design)	[bar]	3,5 / 10
WATER	ΔTmax	[°C]	6
	Consumption	[lt/h]	≈ 330
Power Motor: 6 poles, 400 V, 50 Hz		[kw]	0,55

REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
4			
3			
2			
1			

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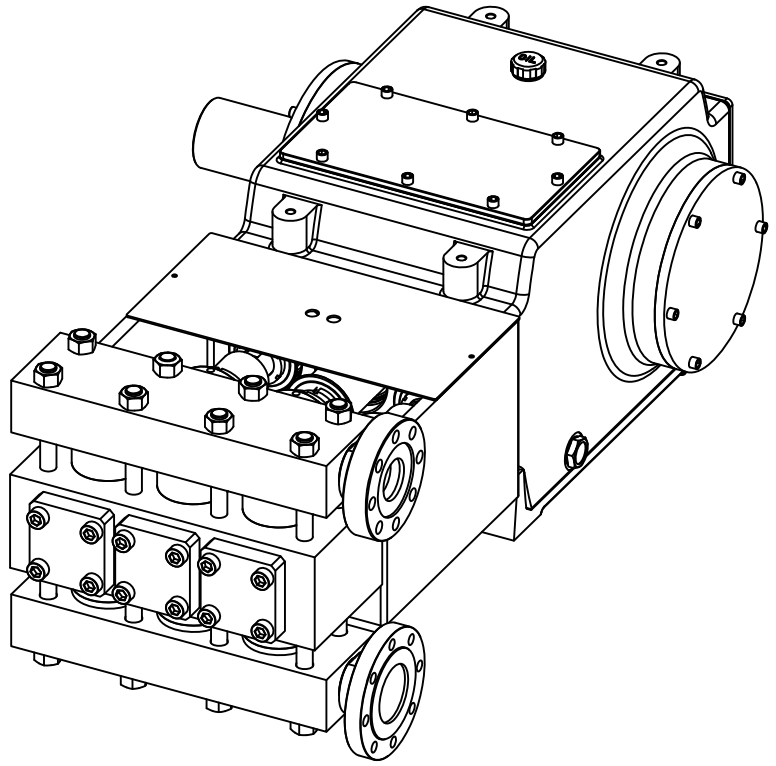
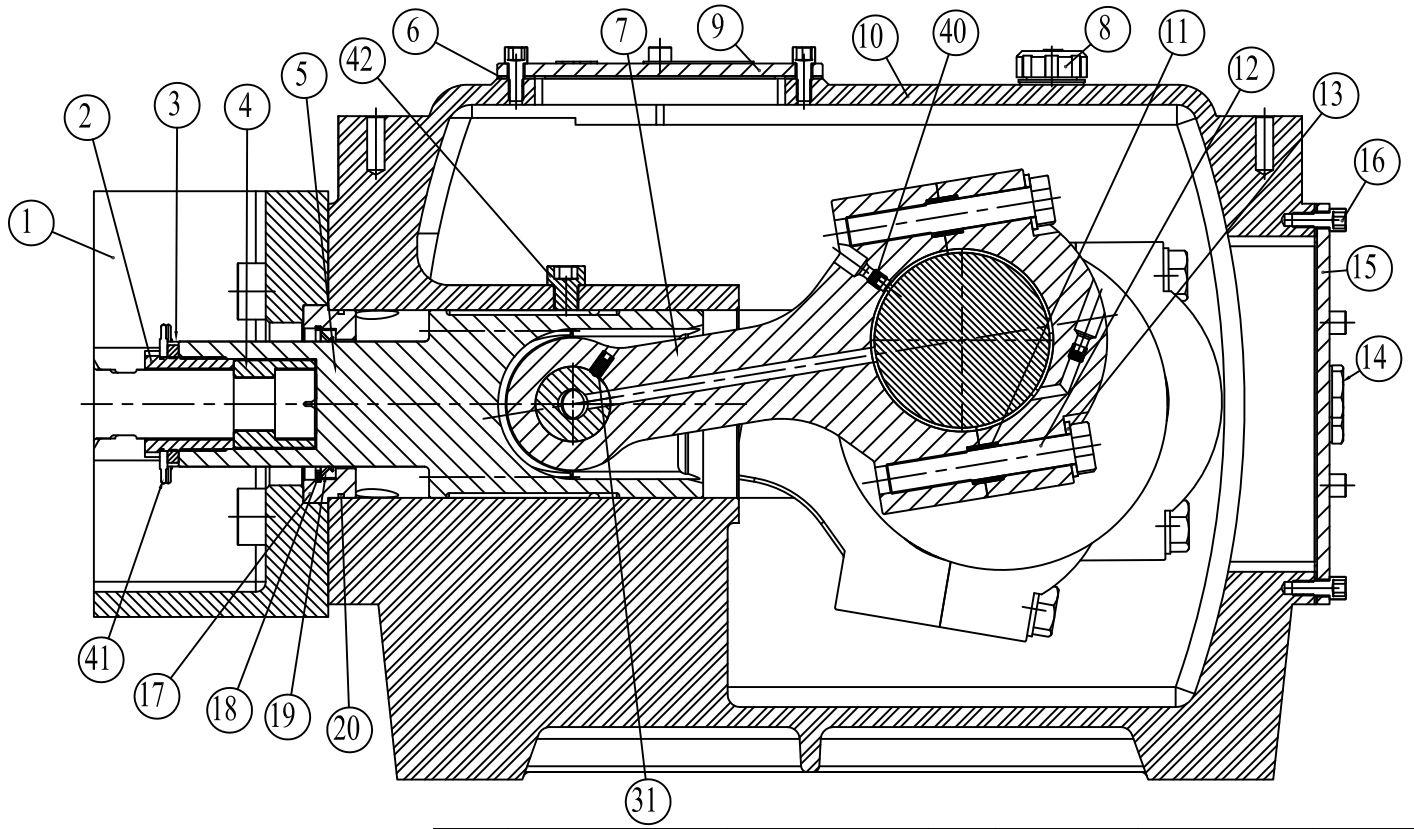
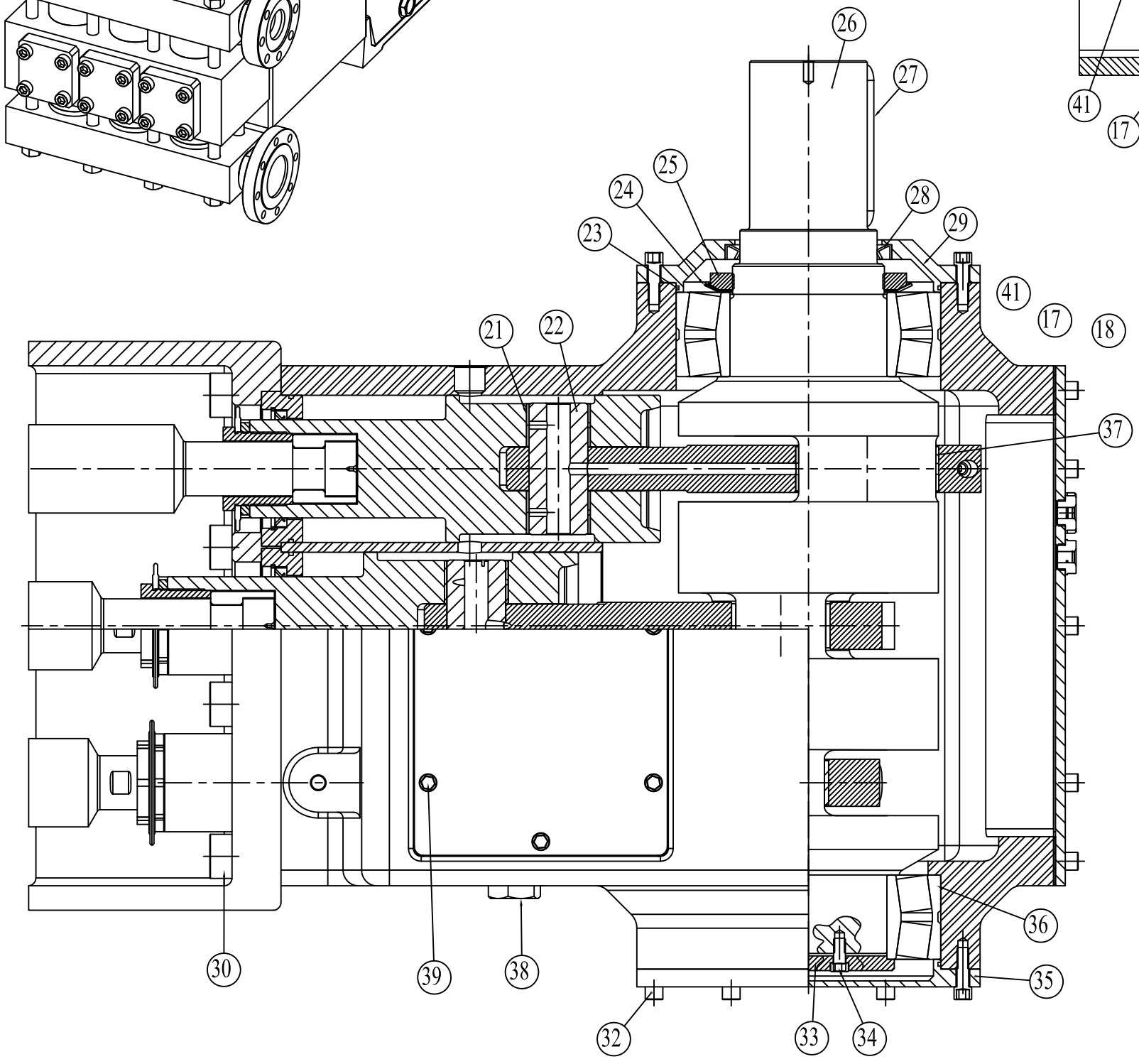
DRAWING Nr. / Disegno Nr.
SAP 3310-PB-122
CUSTOMER Nr. / Nr. Cliente
-

JOB Commessa	2F11	SHEET Foglio	1 / 1
PLANT Impianto		SHEET REVISION Revisione Foglio	2
TITLE Titolo	SLURRY FEEDING - Item Pump: 63 P3 A/B FORCED LUBRICATION	SCALE Scala	-
		SECTION Sezione	-







Pos.	Descrizione	Description	Q.	Material	Dwg./Code	NOTE
42	VITE TCEI	ALLEN SCREW	3	8.8. Galv.	M20 X 20	UNI 5738
41	ANELLO PARASPRUZZI	SPLASH GUARD RING	3	NYLON	3230-41-000-X06	
40	GRANO	SCREW	6	8.8	M12 X 12	
39	VITE TCEI	ALLEN SCREW	8	8.8. Galv.	M12 X 30	UNI 5738
38	TAPPO DRENAGGIO OLIO	OIL DRAIN PLUG	1	POLYMER	1 1/2" G	
37	BRONZINA MANOVELLA	CRANK BUSHING	3	TR 20	3230-37-000-U40	FED. MOGUL
36	CUSCINETTO	BEARING	2	C.S.	SKF N°23132 E	
35	COPERCHIO CIECO	BLIND COVER	1	UNI Fe 410	3230-35-000-A05	
34	VITE TCEI	ALLEN SCREW	3	8.8. Galv.	M12 x 25	
33	COPERCHIO CUSCINETTO	BEARING COVER	1	UNI Fe 410	3230-33-000-A05	
32	VITE TCEI	ALLEN SCREW	12	8.8. Galv.	M12 X 40	UNI 5738
31	GRANO	SCREW	3	8.8	M12 X 20	
30	VITE TCEI	ALLEN SCREW	8	8.8. Galv.	M30 X 100	UNI 5738
29	COPERCHIO ALBERO USCITA	OUTLET SHAFT COVER	1	UNI Fe 410	3230-29-000-A05	
28	GUARNIZIONE MIM	MIM GASKET	1	RUBBER	140 - 170 - 15	
27	LINGUETTA	KEY	1	C.S.	32 X 18 L=165	UNI 6604
26	ALBERO A GOMITI	CRANK SHAFT	1	39NiCrMo3	3230-26-000-D16	NITRUR
25	GHIERA CUSCINETTO	BEARING RING-NUT	1	C.S.	KM 31	
24	ROSETTA DI SICUREZZA	SAFETY WASHER	1	C.S.	MB 31	
23	GUARNIZIONE OR	OR GASKET	2	P5	OR 41000	
22	SPINOTTO	PIN	3	18NiCrMo5	3230-22-00L-E10	CEM. TEMP.
21	BRONZINE SPINOTTO	PIN BEARING	6	HF 2	3230-21-000-U41	FED. MOGUL.
20	GUARNIZIONE OR	OR GASKET	3	P5	OR 4562	
19	GUARNIZIONE MIM	MIM GASKET	3	RUBBER	100x120x12	
18	ANELLO SEEGER	SEEGER RING	3	C.S.	DN 120 x Int.	UNI 7437
17	BUSSOLA CENTRAGGIO	BUSHING	3	UNI Fe 410	3230-17-000-A05	
16	VITE TCEI	ALLEN SCREW	10	8.8 Galv.	M12 X 30	UNI 5738
15	COPERCHIO POSTERIORE	REAR COVER	1	ALLUM.	3230-15-000-U19	
14	SPIA LIVELLO OLIO	OIL LEVEL INDICATOR	2	POLYMER	1"G ELESA HGF 21	
13	RONDELLA VITE BIELLA	WASCHER	6	C.S.	D24	UNI 6600
12	VITE BIELLA	CONNECT ROD SCREW	6	8.8 C.S.	M24 X 2 L=150	EN 24014
11	BUSSOLA CENTR. BIELLA	CONNECTING ROD RING	6	UNI Fe 410	3230-07-000-A05	
10	CARCASSA	FRAME	1	UNI G25 C.I.	3230-10-000-N05	
9	COPERCHIO SUPERIORE	TOP COVER	1	ALLUM.	3230-09-000-U19	
8	TAPPO DI SFIATO	BREATHER PLUG	1	POLYMER.	Elesa 1 1/2" SFP 57-1 1/2	
7	BIELLA	CONNECTING ROD	3	UNI Fe 410	3230-07-00L-A05	
6	GUARNIZIONE COPERCHIO	COVER GASKET	1	GUARNITAL	3230-06-001-XXX	
5	TESTACROCE	CROSSHEAD	3	UNI G.25 C.I.	3230-05-00L-N05	Cromed
4	ANELLO 2/2	2/2 RING	3	AISI 420	3230-04-000-K20	
3	CONTROGHIERA	COUNTER NUTS	3	AISI 304	3230-03-000-K04	
2	GHIERA BLOCCAGGIO PISTONE	PLUNGER LOCK RING-NUTS	2	AISI 420	3230-02-000-K20	
1	DISTAN-COLLET-BATI	SPACER FRAME MANIFOLD	1	C.S. Fe370	3230-01-FUS-A05	

REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
0	ISSUED FOR CONSTRUCTION		

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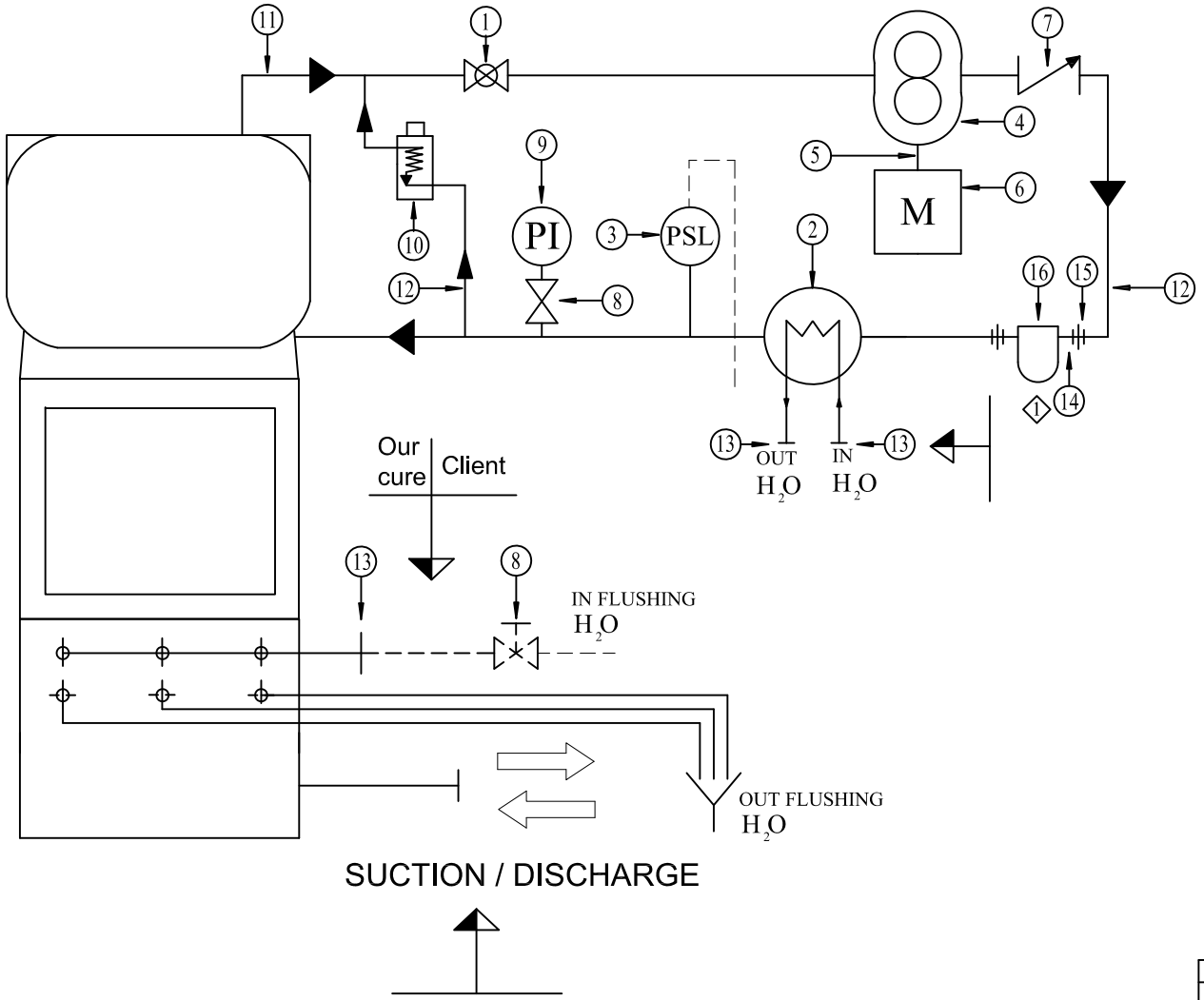
Desmet Ballestra s.p.a.
MILANO - Italy

DRAWING Nr. / Disegno Nr.: 3230-00-001-SEZ
CUSTOMER Nr. / Nr. Cliente: -

JOB Commessa		SHEET Foglio	1 / 1
PLANT Impianto		SHEET REVISION Revisione Foglio	0
TITLE Titolo	Item Pump: POWER END - SECTIONAL DRAWING	SCALE Scala	-
		SECTION Sezione	-



Pos.	DESCRIPTION	Material	Note
1	VALVE	Stainless Steel	DN 1" PN 800 lbs.
2	HEAT EXCHANGER	Body: Carbon Steel Pipe: Stainless Steel	Manufacturer: SESINO Type: T60CB2
3	LOW PRESSURE SWITCH ALARM	Stainless Steel (wedded parts)	Set: 1,5 bar
4	GEAR PUMP	Body: cast iron Internal: stainless steel	Manufacturer: MORGAN Type: PQ15PBY
5	ELASTIC COUPLING	Cast iron	Manufacturer: EUROTRAS Type:
6	DRIVER	-	Manufacturer: ABB Type: M2QA 80M6B - B3 Performance: 0,55 kw, 50 Hz, 6 poles, 3 ph - IP55
7	CHECK VALVE	Stainless Steel	DN 3/4" PN 800 lbs.
8	NEEDLE VALVE	Stainless Steel	1/2" NPT-F
9	PRESSURE INDICATOR	Stainless Steel	Ø 100 Scale: 0 - 10 bar Connection: 1/2" NPT
10	SELF REGULATION VALVE	Stainless Steel	DN 1" PN 800 lbs.
11	PIPE	AISI 304	1" set. 4 barg
12	PIPE	AISI 304	3/4" sch.40
13	FLANGE	AISI 304	1/2" ANSI 150 RF
14	PIPE UNION	Carbon Steel	3/4" FF
15	REDUCTION	Carbon Steel	3/4" x 1/2" - BSP THREADED
16	FILTER	Cast Iron	1/2" x 1/2" - BSP THREADED

PUMP GEAR			
OIL	Capacity	[lt/min]	10
	Pressure (Ex / Design)	[bar]	3,5 / 10
WATER	ΔTmax	[°C]	6
	Consumption	[lt/h]	≈ 330
Power Motor: 6 poles, 400 V, 50 Hz		[kw]	0,55

REVISION Revisione	REVISION HISTORY Storia delle revisioni	DRAWN Autore	DATE Data
4			
3			
2			
1			

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MILANO - Italy

DRAWING Nr. / Disegno Nr.
SAP 3310-PB-122
CUSTOMER Nr. / Nr. Cliente
-

JOB Commessa	2F11	SHEET Foglio	1 / 1
PLANT Impianto		SHEET REVISION Revisione Foglio	2
TITLE Titolo	SLURRY FEEDING - Item Pump: 63 P3 A/B FORCED LUBRICATION	SCALE Scala	-
		SECTION Sezione	-

5.0 USE AND FORBIDDEN MANOVERES

Not to compromise the people security and the machine integrity it is forbidden:

- to use the machine on conditions different from the design ones;
- temper with or elude all protection and safety devices, particularly the safety valve put on delivery end;
- to operate the machine without protections;
- start the machine without lubricant;
- discharge the oil with the machine operating;
- intercept the delivery side;
- intercept the suction side;

6.0 MOVEMENT, TRANSPORT AND STORAGE

6.1 TRANSPORT

For the lifting of the machines it is suitable to employ slings, placed around the supports provided for this use.

It is recommended the utmost care during the transportation since a damage, with infiltration and stay of the water inside the case could damage the machine, even seriously.

6.2 PRESERVATION PERIOD

The preservation period is represented by the time passing from the forwarding to the time of pump start-up, or periods of inactivity after the installation on the plant.

Two preservation modalities have been defined:
1- Short period up to 30 days
2- Long period over 30 days

4-1. The pumps for the short period are forwarded completely installed including the sealings.
After the testing , for the hydraulic end the oil is put in circulation through the valves for at least 4-5 minutes.
The oil used for the test is removed from the crank-mechanism.

4-2. For the long period the sealings from the cylinder are removed and separately forwarded, in order to prevent the damage of the plungers or the cylinders by electro-chemical phenomena.
After the testing the hydraulic side must be disassembled, carefully cleaned, dried, poured with preserving oil and re-assembled at their place, excluded the sealing.
The crank-mechanism is filled with preserving oil and successively discharged.

7.0 INSTALLATION

The supply comprises a metallic base-plate suitable to house the whole unit. Such a base-plate has the machine supporting planes worked rigorously and therefore they are perfectly parallel between them when the base-plate is placed on a plane surface..
The placement of the metallic base-plate on the foundation must therefore restore the conditions most possibly near to the ones previously described.
The maximum mistake of horizontal position admitted in the two directions is 0,1%, whereas the maximum mistake admitted in the parallelism of the various supporting surfaces is 0,05%.
The unit is supplied already assembled on the base-plate.
The machine must be installed in a safe area, accessible just by authorised personnel.
It can be inserted in other machines, providing for the necessary protections.
It must be accessible for a correct maintenance;
- it must be preserved by possible knocks;
- it must be protected by atmospheric agents if externally placed.

7.1 CONNECTION TO THE HYDRAULIC PLANT

The connection of the machine to the plant must be carried out by means of pipings of the same or higher diameter of the suction and delivery connections.
The weight of the pipes or the possible thermal expansions must not load the machine.
Install a safety valve and dampeners suitable to the required service.

7.2 CONNECTION TO THE ELECTRIC PLANT

Generally the protections and the care of the electric motor is up to the customer.
The panel will be carried out according to the rules to be observed at the installation place.

- Check the motor direction of rotation, to prevent the lack of lubrication to the crank-mechanism (see arrow on the drawing and frame);
- Check the correct positioning of the earthing of the motor and of the base-plate.

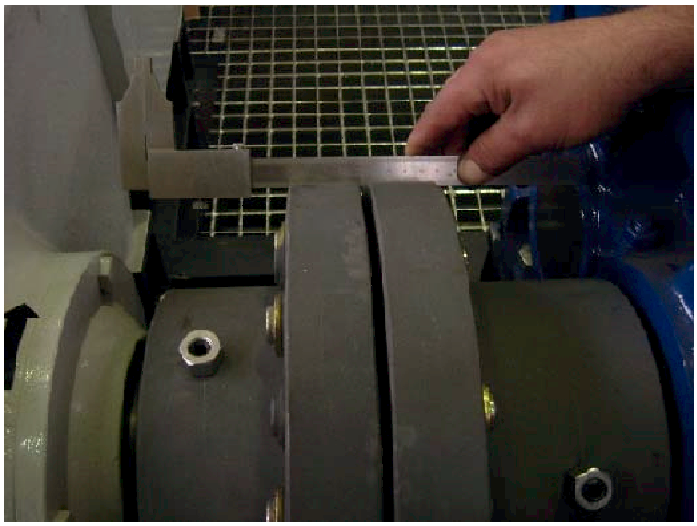
8.0 PREPARATION TO START-UP

Before the unit start-up check that the plant is correctly finished in all its parts, mechanical and electrical.

Particularly check that:

- the planned maintenance of all the components has been carried out;
- on all components is restored the level and the correct lubricant type (see instruction manual of the components);
- all the components have been steadily fixed to the base-plant and the bolts of the hydraulic end is tightened;
- all the foreseen safety devices have been assembled and inserted and that their calibration has been correctly carried out;
- all the safety systems are efficient;
- the suction and delivery pipes have been correctly assembled;
- ensure that the motor turns in the correct director of rotation;
- **The packing should be flushed through relevant connections before starting and closed only after pump stopped. Water consumption: 100 - 150 Lt/h (<u>Only if required</u>)**
- after the start-up check that the absorbed current is the foreseen one or little different.

- Check the coupling alignment for slow and fast:
  Half coupling Concentricity : < 0,15 mm
  Front parallelism error ± 0,1 mm



- Forced lubrication dwg. "SAP 3010-PB-120"

Connecting the water input / output heat exchanger flange ½" 150 RF with the flow about 330 Lt/h.
The system is supplied to mantein in the crankmechanism the same oil level 3 barg.

Before start up the main pumps you must run the forced lubrication system
See drawing "SAP 3010 PB 120"

- Run gear pump motor and wait the pressure arrived at about 2-3 barg

9.0 MAINTENANCE AND REVISION

The pumps of STP3 series are designed in order to obtain the following results:

- utmost steadiness of the unit;
- alignment of all reciprocating motion parts;
- easy maintenance,
- lowest maintenance and operation costs.

In order to obtain the above, the pumps have been designed on the ground of the following criteria:

- a very high safety degree adopted in dimensioning all parts subject to stress
- reduction to the minimum of machine displacement during frame working and hosing of reciprocating motion parts in seats obtained from a unique machine operation during working phase

With the aim of protecting personnel safety, it is necessary during maintenance operations that:

- maintenance is carried out by qualified personnel;
- due to the particular configuration of the pumping unit it is necessary to check the base-plate tightening at the foundation during the assembling and disassembling stages.
- maintenance is carried out when the machine is stopped, turning voltage off;
- voltage cannot be restored by other operator but the one who is doing maintenance;
- discharge and suction gates are closed;
- machine is cooled down to ambient temperature before doing any kind of operations;
- all individual protection devices foreseen by rules in force are used.

9.1 HYDRAULIC END DISASSEMBLY

Check that there is no tension to the motor and that there is no pressure on suction and delivery end, only after having checked these conditions act as follows:

Disassemble hydraulic cylinders and sealings:

With reference to the sectional drawings:
Hydraulic end N°3239-BD-000-SEZ
Crank mechanism N°3230-00-001-SEZ

Then act as follows :

1) Bring to low dead point the piston Pos 120
2) Loosen and separate the piston from the thrust rod
3) Ref. dwg 3230-00-001-SEZ loosen the counter-ring-nut Pos 3 and the ring-nut Pos 4 extract the piston extension Pos 2
4) Ref. dwg 3239-BD-000-SEZ loosen the ring-nut Pos 118/119/129
   Remove the 4 screws Pos 122 and remove plunger flange Pos. 111
   Act with the same procedure with the remaining cylinders/plunger

Disassembling of valve columns: Ref. 3239-BD-000-SEZ
Rif. N° 3225-D0-003-MON BALL VALVE DISASSEMBLING

1) Unscrew the screws Pos 102
2) Remove the discharge manifold Pos 103

Act with the same procedure with the low discharge manifold

9.2 CRANKSHAFT MECHANISM DISASSEMBLY

Preliminary operations:

- Empty the crankcase from the lubricating oil
- Remove the gear box from the base-plate and the coupling
- Remove the screws which fix the upper and rear cover
- Remove the upper and rear covers paying attention not to damage the gasket in between
- Unscrew the connecting rod fixing screws and remove the caps with relevant half-bushings
- push the cross-head onwards
- keep the three connecting rods on the frame
- extract the blind cover
- remove the screws that fix the exit shaft cover
- extract the shaft
- loosen the splash guard disk and unscrew the plunger joint ring nut
- extract from the frame the connecting rods which will carry together the pin, the connecting rod small end bushing, the cross-head and the rod
- extract the pin, hence disengaging the connecting rod from the cross-head
- to extract the connecting rod small end bushing use the press if necessary

9.3 CRANKSHAFT MECHANISM REASSEMBLY

The reassembly of the crankshaft mechanism is carried out with reverse sequence to the disassembling one, paying attention on the following:

- during crank bushing assembly on connecting rod check that between contact surfaces THERE IS NO OIL
- fixing screws of connecting rod to the connecting rod cap will have to be tightened to nominal torque 3 Kgm
- keying of shaft-bearings-frame is done using a jack and having care to centre-position the particulars
- screws that fix power inlet side cover must be properly tightened but not to the extent to cause seeger deformation
- fixing screws of tanks shall be clamped with threads braking loctite

- once assembly is over, oil everything and turn the pump manually and check any possible hardening.

9.4 HYDRAULIC END REASSEMBLY

Hydraulic end reassembly is carried out with reverse sequence to the disassebling one, paying attention to the following:

- assembly of valve seats must be done as shown on the drawing and without reversing the operations;
- Assembly of packings must be done as shown on the drawing having care to position the bladder cut 180° from previous ring and 90°from previous unit;
- grease the OR before assembling them;
- comply with bolts tightening torques stated in the table;
- **RESTORE OIL LEVELS CONSULTING THE ENCLOSED TABLE OF SUGGESTED OILS**

Adjustment of seal packings tightening is very important not only during machine running-in but also when packings are replaced
During starting phase with new packings, adjust the stuffing box ring nuts, letting the main packing drip.
It is important not to leave any space between a bladder ring and the other. Any possible axial clearances of the packings would cause damages to the hydraulic cylinder and to the plunger.

9.5 LUBRICATION

9.5.1

The crank mechanism and the gear reducer of the STP pumps must run in an oil bath the crankcase and gear box must be filled up to the required level with proper lubricating oil.
We suggest use of oils with viscosity from 200 to 240 Cst at 40°C, with normal ambient temperature; lower or higher viscosity depending on lower or higher temperatures (see D). Selection table 1 shows standard lubricating oils.
Check periodically oil level and replace the lubricating oil after the first 500 hours of work and then every 3000 hours.

9.5.2

Check periodically oil level, replacing it if necessary, and drain any water. Periodically turn shaft several revolutions to keep bearings and other critical surfaces coated. Pump groups, if possible must be wrapped in heavy, moisture-proof sheet made of polythene or similar materials.

TABLE 1

Manufacturer	Oil type
ESSO	Nuto 220
SHELL	Tellus C 220
AGIP	Acer 220
MOBIL	Mobilgear 629
TOTAL	Azolla 220
FINA	Solna 220
BP	Energol HB 220

N.B.: The tab. 1 is referred to ambient/site conditions up to –10°C.
If temperature is up to –20°C:

Manufacturer	Oil type
ESSO	Glycolube 220
MOBIL	Glygoil 30
ELF	Reductelf Synthese 220
AGIP Or equivalent	Blasia S-220

Quantity:
Fill in the crankcase with oil of 60 Lts approx. up the the level during the operation.
Gear reducer about 9.5 Lt approx. up the the level during the operation.

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POMPA / Pump/Pompe		MOTORE / Drive/Moteur	
TIPO Diam.Pist. X Corsa	**STP 3 95 x 120**	**TIPO**	**BROOK CROMPTON**
Pump Type/type Plunger /Stroke		Type/type	**AU-DF 250 MA4**
N°MATRICOLA	**12020/1**	**N°MATRICOLA**	
Serial no./nr. de série		Serial no./nr. De série	**LG954230**
N°COLPI- RPM	**123**	**N°GIRI**	**1480**
Strokes no./nr. de coups		RPM/tours	**Suitable for inverter**
PORTATA M 3 / h	**3,6 / 17,95**	**KW. 55**	**AMP 94,1** **Volt. 380** **Hz.50**
Capacity/debit lt/h.		**RIDUTTORE marca / tipo : GSM**	
PRESSIONE ASP / MANDATA MAX.	**Bar g 4 / 74**	**Gear reducer made/type RXP2 808 /B/ECE/N/M1**	
Suct./ Max Pressure/pression max		**Rapporto - Ratios**	**1 : 12**
TARATURA VALVOLA DI SICUREZZA	**Bar g 77**	**N°MATRICOLA**	
Safety Valve setting		Serial no./nr. De série	**12002051/2**
SIGLA POMPA	**63 P3 A**	**CERTIFICATO**	
Pump Item		Certificate/certicat	
Procedura N° SA 112 rev.1	Performance Test	**Documento** SA141 rev.1	**Hydrostatic test**
Procedure/procédui SA 153 rev.1	Mech. Runn. Test	Document/document	

Prova di pressione idraulica Bar — **Aspirazione 27** — **Mandata 120**

Hydraulic test no./essai de pression hydraulique nr. — Suction/aspiration — Delivery/refoulement

RPM	Press.aspiraz. Sucti. Pressure Bar	Press. Mandata Disch. Pressure Bar	Portata. Flowrate Débit M 3/h	Absorbed Power A	Poten.rich. Rqrd. Power Kw	Rend.mot: Mot.efficien. n %	Poten.Ass. Absor.Power Kw Note (1)
125,4	1	**0**	19,1	15,1	7,3		-
125,0	1	**20**	18,8	38,3	20,3	86,0	17,5
124,4	1	**40**	18,6	54,1	30,4	89,0	27,1
123,6	1	**60**	18,5	74,1	41,6	91,0	37,9
123,0	1	**74**	18,1	83,2	49,7	92,0	45,7
122,5	1	**77**	18,0	86,1	51,3	93,0	47,7
Prova a giri variabili - Variable speed test							
123,0	1 100%	**74**	18,1	83,2	49,7	93,0	46,2
92,6	1 75 %	**74**	14,0	64,3	37,0	93,0	34,4
61,2	1 50 %	**74**	9,2	49,2	26,6	93,0	24,7
29,2	1 25 %	**74**	4,2	30,1	15,0	93,0	14,0
23,2	1 20 %	**74**	3,5	23,9	12,4	93,0	11,5

NOTE (1) Absorbed power at reducer fast shaft

Remarks/Notes Pump temperature rising to 40°C Gear reducer rising to 50 °C with Amb. Temp 25 °C

Temp. Pompa a regime 40°C - Riduttore a regime 50 °C con temp amb. 25°C

DATA Date/Date 04-09-2012

Prova eseguita con H_2O durante la prova a temperatura 19 - 42 C

Test performed with H_2O at temp.19- 42°C/ Essai effectué avec eau a température 19- 42 °C

Data / *Date*	**Desmet Ballestra**	

desmet ballestra

Certificato di Collaudo
Test Report

Doc. n°

Rev. **00** | Pag. **1 / 1**

POMPA / Pump/Pompe		MOTORE / Drive/Moteur	
TIPO Diam.Pist. X Corsa	**STP 3 95 x 120**	**TIPO**	**BROOK CROMPTON**
Pump Type/type Plunger /Stroke		Type/type	**AU-DF 250 MA4**
N°MATRICOLA	**12020/2**	**N°MATRICOLA**	
Serial no./nr. de série		Serial no./nr. De série	**LG954231**
N°COLPI- RPM	**123**	**N°GIRI**	**1480**
Strokes no./nr. de coups		RPM/tours	**Suitable for Inverter**
PORTATA M 3 / h	**3,6 / 17,95**	**KW. 55**	**AMP 94,1** **Volt. 380** **Hz.50**
Capacity/debit lt/h.		**RIDUTTORE marca / tipo : GSM**	
PRESSIONE ASP / MANDATA MAX.	**Bar g 4 / 74**	**Gear reducer made/type RXP2 808 /B/ECE/N/M1**	
Suct./ Max Pressure/pression max		**Rapporto - Ratios**	**1 : 12**
TARATURA VALVOLA DI SICUREZZA	**Bar g 77**	**N°MATRICOLA**	
Safety Valve setting		Serial no./nr. De série	**12002051/1**
SIGLA POMPA	**63 P3 B**	**CERTIFICATO**	
Pump Item		Certificate/certicat	
Procedura N° SA 112 rev.1	Performance Test	**Documento** SA141 rev.1	**Hydrostatic test**
Procedure/procédui SA 153 rev.1	Mech. Runn. Test	Document/document	

Prova di pressione idraulica Bar — **Aspirazione** **27** — **Mandata** **120**
Hydraulic test no./essai de pression hydraulique nr. — Suction/aspiration — Delivery/refoulement

RPM	Press.aspiraz. Sucti. Pressure Bar	Press. Mandata Disch. Pressure Bar	Portata. Flowrate Débit M 3/h	Absorbed Power A	Poten.rich. Rqrd. Power Kw	Rend.mot: Mot.efficien. n %	Poten.Ass. Absor.Power Kw Note (1)
125,5	1	**0**	19,0	15,3	7,4		-
125,1	1	**20**	18,8	37,9	19,8	86,0	17,0
124,6	1	**40**	18,7	54,3	30,5	89,0	27,1
123,7	1	**60**	18,5	71,9	41,8	91,0	38,0
123,1	1	**74**	18,1	84,1	50,1	92,0	46,1
122,6	1	**77**	18,0	87,0	52,3	93,0	48,6
Prova a giri variabili - Variable speed test							
123,1	1 100%	**74**	18,1	84,1	50,1	93,0	46,6
92,2	1 75 %	**74**	14,2	65,6	37,7	93,0	35,1
61,6	1 50 %	**74**	9,0	49,6	26,8	93,0	24,9
29,6	1 25 %	**74**	4,3	30,5	15,2	93,0	14,1
23,0	1 20 %	**74**	3,5	24,2	12,6	93,0	11,7

NOTE (1) Absorbed power at reducer fast shaft
Remarks/Notes Pump temperature rising to 40°C Gear reducer rising to 50 °C with Amb. Temp 25 °C
Temp. Pompa a regime 40°C - Riduttore a regime 50 °C con temp amb. 25°C

DATA Date/Date 04-09-2012

Prova eseguita con H_2O durante la prova a temperatura 19 - 42 C
Test performed with H_2O at temp.19- 42°C/ Essai effectué avec eau a température 19- 42 °C

Data / *Date*	**Desmet Ballestra**	

desmet ballestra

INDICE GENERALE DEI CERTIFICATI
GENERAL CERTIFICATION INDEX

POMPA / Pump
item: 63P3 A/B
CERTIFICATI MATERIALI /TEST IDRAULICO /CE ATEX DICHIARAZ.

CERTIFICATI MATERIALI 3.1 POMPA
3.1 MATERIALS PUMP CERTIFICATION

Job: 2F11
Service: SLURRY FEEDING
Model: STP3 95x120

CRANKMECHANISM *N° 3230-00-001-SEZ*				
Descrizione Description	N° Disegno Dwg N°	Materiale Materials	Costruttore Manufacturer	N° Certificato Certificate N°
Frame	3230-10-000-N05	UNI G25 C.I.	Quaglia & Colombo	35.12
Crankshaft	3230-26-000-D16	39NiCrMo3	IMS	562342-3

HYDRAULIC END *N° 3239-BD-000-SEZ*				
Descrizione Description	N° Disegno Dwg N°	Materialc Materials	Costruttore Manufacturer	N° Certificato Certificate N°
Plunger	3239-BD-120-K16	AISI 316L + Carb. Tung.	OLARRA	117680
Valve Body	3239-BD-109-N05	A 105 Galv.	Forgiatura Moderna Arese	A11-2659
Valve Seat	3239-BD-107-K04	AISI 304 + Stell.	Gerdeau Sidenor	1516666
Valve Lantern	3239-BD-104-K04	AISI 304	Gerdeau Sidenor	1516666
Cylinder	3239-BD-115-K04	AISI 304	Gerdeau Sidenor	1516560
Suction Manifold	3239-BD-110-N05	A 105 Galv.	Forgiatura Moderna Arese	A11-2659
Discharge Manifold	3239-BD-103-N05	A 105 Galv.	Forgiatura Moderna Arese	A11-2659

Fonderia
Quaglia & Colombo s.r.l.

Sede Amm. e Comm. Via Tintoretto, 14
Stabilimento Via XX Settembre, 145
20025 Legnano (Milano) Italy
Telefono 0331.402473
Telefax 0331.406185
www.quagliaecolombo.it
E mail: commerciale@quagliaecolombo.it

CERTIFICATO DI PROVE MECCANICHE
MECHANICAL TEST CERTIFICATE
EN 10204-3.1 N. 35.12

MATERIALE/MATERIAL : Ghisa G,25 UNI 5007
DESCRIZIONE/DESCRIPTION : Fusionne Mod. 3230-10 n. 04

ORDINE/ORDER : 11286
DDT N./DELIVERY NOTE : 69/BF DEL 28.02.12

ANALISI CHIMICA/CHEMICAL ANALYSIS

Colata /test	C%	Si%	Mn%	P%	S%	Mg%	Cr%	Cu%
	3,15	1,87	0,91	0,03	0,04			

CARATTERISTICHE MECCANICHE/MECHANICAL PROPERTIEIS

Provetta N.sez.mmq.	R T N. mmq.	R S N mmq.	H B	A %

GIUDIZIO/REMARKS : conforme/conform

FONDERIA QUAGLIA & COLOMBO S.R.L.

Mod. 21 Rev.1

Cap. Soc. € 90.000,00 Società Unipersonale
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IMS S.p.A.
acciai speciali

Certificato d'analisi IMS

S.p.A. - Sede: via Alessandro Polini, 450 - 20862 Arcore (MB) - www.ims.it
00485910012 - Reg. Imp. Monza e Brianza - P.I. IT 02387540962 - REA: MB 264817
Cap. Soc. € 17.200.000,00 i.v. - Direzione e coordinamento: JACQUET METAL SERVICE S.A.

Cert N° 562342-3 09/03/2012
Test Reference 1703888

Emesso da
IMS SpA
Filiale di Arcore
Via Alessandro Polini, 450
20862 Arcore (Monza e Brianza)

Venduto a:
Sped A: TORNMETAL SRL, VIA DEL LAVORO, 4, 22074 LOMAZZO (Como)

Riferimento

Cliente	82372/0	**Vs Ordine**	12109 (02/03/2012)
Ns Ordine	586306-1-1	**DDT**	562342-1 (09/03/2012)

Informazione ProdoRo

Barra tonda laminata 39NiCrMo3 Bonificato
280mm x 930mm Lunghezza fissa

Colata 35840-2011 — **Pzi** 5 — **KGS** 2.266

Composizione Chimica

C	Mn	Si	P	S	Cr	Ni	Mo
0,4	0,7	0,27	0,019	0.024	0,91	0,89	0,176
Cu	**Al**	**N**	**Sn**	**Ti**	**V**	**H**	
0,01	0,026	0,0064	0,002	0,0014	0,005	1.70 ppm	

Caratt. Meccaniche

Rm (N/mmq) (L)	Re (N/mmq) (L)	A (%) (L)	Z (%) (L)
832 N/ Sq mm	651 N/ Sq mm	19,2 %	64,1 %
HB (L)			
259.0 - 261.0			

Jominy/Durezza Rockwell C

1,5mm	3,0mm	5,0mm	7,0mm	9,0mm	11,0mm	13,0mm	15,0mm
58	58	56	56	55	56	54	54
20,0mm	**25,0mm**	**30,0mm**	**35,0mm**	**40,0mm**	**45,0mm**	**50,0mm**	
52	47	45	41	41	40	39	

Trattamento Termico

T.T	Temp	Ora	Mtd Raffredd

Prove Resilienza

Res	UM	Temp	D	Rsil1	Rsil2	Rsil3
KCV	J	20 C	L	66,0	54,0	65,0

Microinclusione ASTM E45

A		B		C		D	
F	G	F	G	F	G	F	G
1,3	1,5	0,0	0,0	0,0	0,0	1,0	0,0

Grano austenitico/Austenitic grain: 5-8
Controllo ultrasuoni/Ultrasonic test: SEP 1921-84 2 C/c
Norma di riferimento/Reference standard: EN 10083
Tipo di certificato/Type of certificate: EN 10204 - 3.1

Si dichiara che il prodotto sopra descritto è conforme alle prescrizioni dell'ordine.
Il presente certificato IMS è copia conforme all'originale del produttore custodito presso i nostri archivi.
Controllo qualità di filiale: Daniele Rampinelli

ELVINOX S.r.l.
Art.: BL6L 100 Colata: 334474 Cliente: SABI-SABI S.r.l. Pompe e Impianti Rif.: TELEFONICO del 13.06.2012
D.d.T.: 00009176 del 15/06/12 nr 1 KG 63,00 Ordine: OCVEND201200011505 del 14/06/12
IL PRESENTE CERTIFICATO E' CONFORME ALL'ORIGINALE: R.G.Q.O. V. PARISOLI

Larrondo LOIU (VIZCAYA) España
P.O. Box 1.323/48080 Bilbao
Tel. 34-(4) 4 71 13 00
Fax.34-(4) 4 53 16 36

Quality Management System Approved CERT.N° SGI 6000360

ACEROS INOXIDABLES
OLARRA

ELVINOX SRL.
LOCALITA CASCINA FAUSTINA
20080 ALBAIRATE (MI) - ITÁLIA

Trade Mark - Zeichen des Lieferwerkes / Anagrama del suministrador

Works Inspector Stamp - Werkssachverständiger / Sello del Inspector 3

Certificate type - APZ Nach / Certificado tipo: EN 10204/3.1		Certificate nº - Prüf-Nr / Certificado nº: 117680	Date - Datum - Fecha: 06 - 06 - 2012
Our order Nº / Werks - Nr / Nº de Referencia: 497720	Heat / Schmelze / Colada: 334474	Your order Nº / Bestell - Nr / Pedido Nº: 1864	
Steel Grade / Werkstoff / Calidad: AISI-316-L MECAMAX		According to / Entsprechend / Corresponde: ASTM A 479 / A 479M-11.	

Shape and Size - Gegenstad / Perfil y dimensión	Tolerance - Toleranz / Tolerancia	Bundles / Bunde / Bultos	Bars / Stäbe / Barras	Weight / Gewicht / Peso
ROUND 100 mm	k 13 /ISO 286-1 /10060	2		1939 Kg

Requirements - Anforderungen - Exigencias

ASTM A 276-10.
EN 10.088-3.2005.
NACE MR-0175-2003/ISO 15156-3 2009.
TP.316-1.4404.

Melting process / Erschmelzungsart / Proceso de Fusión	Heat treatment / Wärmebehandlung / Tratamiento térmico
E.A.F. / A.O.D.	1060C 4H/Std WATER/WASSER/AGUA

Solution annealed/Abgeschreckt/Hipertemple-Turned/Drehen/Torneado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Dimension of Specimen / Abmessungen des Probestabes / Medida de las probetas		Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte HBw	Impact test / Kerbschlag / Resiliencia ISO V Jules
RD. 12,50 mm.	Min.	170		485		40	50		
	Max.								
Temperature ºC: 20	Spec. Nº. / Probe Nr. / Pro Nº.: 1	272	313	574		56	73	156	

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co	
Min.						16,00	2,00	10,00			
Max.	0,030	1,00	2,00	0,045	0,030	18,00	3,00	14,00	0,1000		
	0,020	0,34	1,65	0,032	0,028	16,55	2,10	10,00	0,0295	0,09	

Visual and dimensional inspection / Besichtigung und Ausmessung / Control visual y dimensional	Radioactivity inspection / Radioaktivitätskontrolle / Control de Radioactividad	Antimixing test / Spektrosk Verwechslungspr / Antimezcla	Grain Size / Korngrösse / Tamaño de grano
O.K.	O.K.	O.K.	

Remarks - Bemerkungen - Observaciones

EDV / EDP
Acc. EN 10.204
Alfredo Molina
Certification
Mng.

Works Inspector
Der Werkssachverständige
Inspector de fábrica

FORGIATURA MODERNA ARESE

CERTIFICATO DI COLLAUDO

Inspection certificate / Certificat de recette

EN10204/3.1

Nº **A11-2659**
Del **09/06/11**
Foglio 1 di 1

Cod. A0798	**ORDINE** Order/Commande	**MATERIALE** Material/Matiere
	11112	ASTM A105

SPECIFICHE RICHIESTE
Specification request/Specifications technique

ASTM + NACE MR 01.75

DESCRIZIONE MATERIALE Material description	**DISEGNO/DIMEN.** Drawing/Dimension	**COLATA** Heat/Coulee	**PROVA** Test Nº	**COMM.** Prod. order
Nº2 PIASTRA LAMINATA	PT 360 X 125 X 80	6676	3471	2020/1
Nº1 PIASTRA LAMINATA	PT 330 X 175 X 120	6676	3471	2020/2
Nº2 PIASTRA LAMINATA	PT 375 X 120 X 60	6676	3471	2020/3
Nº1 PIASTRA LAMINATA	PT 330 X 155 X 110	6676	3471	2020/4
Nº8 PIASTRA LAMINATA	PT 595 X 180 X 100	6676	3471	2020/5
Nº4 PIASTRA LAMINATA	PT 575 X 245 X 180	6676	3471	2020/6
Nº4 PIASTRA LAMINATA	PT 450 X 140 X 80	6676	3471	2020/7
Nº2 PIASTRA LAMINATA	PT 450 X 165 X 140	6676	3471	2020/8

CARATTERISTICHE MECCANICHE
Mechanical requirements/Caracteristiques mecaniques

					Rp - Yp N/mm2	Rm - Ts N/mm2	A - E %	Z - Ra %				HB
PROVA Nº Specimen nº	**DIREZ.** Direction	**Ø** mm	**Lo** mm	**Min Max**	**250**	**485**	**22**	**30**				**187**
3471	long	12,5	50		277	499	26,4	49,8				146-144

CARATTERISTICHE CHIMICHE
Chemical requirements/Caracteristiques chimiques

		C	Mn	Si	P	S	Cr	Ni	Mo	Al	Cu	V	Nb	Ceq.
COLATA	Min.		0,60	0,10										
Coulee	Max.	0,35	1,05	0,35	0,035	0,040	0,30	0,40	0,12		0,40	0,08	0,02	
6676		0,18	1,10	0,23	0,005	0,001	0,09	0,14	0,07	0,029	0,13	0,002	0,001	0,4137

VISUAL AND DIMENSIONAL INSPECTION CONFORMS TO CONTRACTUAL REQUIREMENTS - THE PRODUCTS ARE IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER

FORGIATURA MODERNA ARESE SPA
DIVISIONE ASA

Sistema Gestione Qualità Certificato LRC16003

GERDAU SIDENOR

Reinosa Plant

MILL TEST CERTIFICATE

ISO 9001 - ISO/TS 16949

Product Made in Spain

CUSTOMER:DELTA ACCIAI SPA		WORKS REFERENCE:1516666
REFERENCE:395	SALES ORDER:236555-21	HEAT NUMBER:99660
PRODUCT NR:	MASTER REFERENCE:137709	ROLLED:28.06.2011

REQUIRED PRODUCT

AISI 304/304 L(1.4301/1.4307) ROUND BARS TURNED SOLUTION ANNEALING 120 +0/+0,54 mm

SPECIFICATION´S TOLERANCE 6.400/7.400 mm RANDOM

EXPEDITION DELIVERY:80349039 WEIGHT (KG):5.356 BUNDLES:2 UNITS:8

MADE ACCORDING TO

EN 10272 - 2007 ; EN 10088-3 - 2005 ; ASTM A276 AE1 2000 ; AD-W2 - 01.09.1998

AD-W10 - 01.11.1987 ; DIN 17440 - .09.1996 ; ASTM A193-A193M 08 2008

ASTM A479-A479M - 2002A ; ASME SA479-SA479M - 2001 ; ASTM A182-A182M - . .2000

NACE MR0175 2002 01.01.2002 ; SIDENOR DELTA-001 1 10.06.2009

AISI STAINLESS STEELS - 01.03.1999 ; EN 10204 :2004 OCT. 2004 3.1

CHEMICAL ANALYSIS OF HEAT U:% HEAT NUMBER:99660

	C	Mn	Si	P	S	Cr	Ni	N
Min.						18,000	8,000	
Max.	0,030	2,000	0,750	0,045	0,030	19,500	10,000	0,1000
Cer.	0,021	1,700	0,225	0,029	0,025	18,240	8,150	0,0860

MECHANICAL PROPERTIES AS SUPPLIED (CONDITIONS)

Specimen Test location:At 12,5 mm from the surface

MECHANICAL PROPERTIES AS SUPPLIED (TEST)

Standard (DIN 50125- .04.1991) ; Tensile test specimen direction (Longitudinal):Longitudinal

Tensile Strength (515/680 MPA):640 MPA ; Yield Strength (Rp(0,2%) >= 207 MPA):Rp(0,2%) 279 MPA

Elongation ((5d) >= 45 %):(5d) 57,3 % ; Reduction of Area (>= 50 %):74,7 %

Notch impact sample direction (Longitudinal):Longitudinal

Notch Impact sample type (CHARPY-V):CHARPY-V ; Notch Impact test Temperature (20 °C):20 °C

K(1) (>= 100 J):282 J ; K(2):270 J ; K(3):286 J ; Hardness (<= 215 HB):183 HB

ADDITIONAL TESTS

Structure:Austenite ; Standard (EN ISO 3651-2-01.05.1998) ; Intercrystalline Corrosion:ok

NON DESTRUCTIVE TESTS

Internal defects standard (STAHL EISEN SEP1921-01.12.1984)

Internal defects type/method (Test group 3 - Defect <= E/e)

ULTRASONIC CONTROL 100%: OK. SEP1921 Group .3 Class E/e ; CRACKS CONTROL 100%:OK

ANTIMIXING TEST SPECTROSCOPY 100%: OK

ADDITIONAL INFORMATION

SOLUTION ANNEALED,(Hiperquenching) at 1050°C-IN WATER - MELTING PROCESS: EAF+ VOD + LF

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER´S SPECIFICATION

APPROVED BY:NATALIA MANTILLA DIAZ SIGN:

DATE:08.07.2011

REF.:6001392950000

Metallurgical Technical annalist level II

GERDAU SIDENOR

Reinosa Plant

MILL TEST CERTIFICATE

ISO 9001 - ISO/TS 16949

Product Made in Spain

CUSTOMER:DELTA ACCIAI SPA		WORKS REFERENCE:1516560
REFERENCE:395	SALES ORDER:236555-26	HEAT NUMBER:99660
PRODUCT NR:	MASTER REFERENCE:141403	ROLLED:29.06.2011

REQUIRED PRODUCT

AISI 304/304 L(1.4301/1.4307) ROUND BARS TURNED SOLUTION ANNEALING 150 +0/+0,63 mm

SPECIFICATION´S TOLERANCE 5.000/6.000 mm RANDOM

EXPEDITION DELIVERY:80349039 WEIGHT (KG):5.078 BUNDLES:2 UNITS:6

MADE ACCORDING TO

EN 10272 - 2007 ; EN 10088-3 - 2005 ; ASTM A276 AE1 2000 ; AD-W2 - 01.09.1998
AD-W10 - 01.11.1987 ; DIN 17440 - .09.1996 ; ASTM A193-A193M 08 2008
ASTM A479-A479M - 2002A ; ASME SA479-SA479M - 2001 ; ASTM A182-A182M - . .2000
NACE MR0175 2002 01.01.2002 ; SIDENOR DELTA-001 1 10.06.2009
AISI STAINLESS STEELS - 01.03.1999 ; EN 10204 :2004 OCT. 2004 3.1

CHEMICAL ANALYSIS OF HEAT U:% HEAT NUMBER:99660

	C	Mn	Si	P	S	Cr	Ni	N
Min.						18,000	8,000	
Max.	0,030	2,000	0,750	0,045	0,030	19,500	10,000	0,1000
Cer.	0,021	1,700	0,225	0,029	0,025	18,240	8,150	0,0860

MECHANICAL PROPERTIES AS SUPPLIED (CONDITIONS)

Specimen Test location:At 12,5 mm from the surface

MECHANICAL PROPERTIES AS SUPPLIED (TEST)

Standard (DIN 50125- .04.1991) ; Tensile test specimen direction (Longitudinal):Longitudinal
Tensile Strength (515/680 MPA):620 MPA ; Yield Strength (Rp(0,2%) >= 207 MPA):Rp(0,2%) 259 MPA
Elongation ((5d) >= 45 %):(5d) 61,2 % ; Reduction of Area (>= 50 %):77,8 %
Notch impact sample direction (Longitudinal):Longitudinal
Notch Impact sample type (CHARPY-V):CHARPY-V ; Notch Impact test Temperature (20 °C):20 °C
K(1) (>= 100 J):279 J ; K(2):282 J ; K(3):276 J ; Hardness (<= 215 HB):178 HB

ADDITIONAL TESTS

Structure:Austenite ; Standard (EN ISO 3651-2-01.05.1998) ; Intercrystalline Corrosion:ok

NON DESTRUCTIVE TESTS

Internal defects standard (STAHL EISEN SEP1921-01.12.1984)
Internal defects type/method (Test group 3 - Defect <= E/e)
ULTRASONIC CONTROL 100%: OK. SEP1921 Group .3 Class E/e ; CRACKS CONTROL 100%:OK
ANTIMIXING TEST SPECTROSCOPY 100%: OK

ADDITIONAL INFORMATION

SOLUTION ANNEALED,(Hiperquenching) at 1050°C-IN WATER - MELTING PROCESS: EAF+ VOD + LF

TECHNOLOGY & QUALITY CERTIFIES THAT THE PRODUCT FULL FILLS THE ORDER´S SPECIFICATION

APPROVED BY:NATALIA MANTILLA DIAZ SIGN:

DATE:08.07.2011

REF.:6001391180000

Metallurgical Technical analist level II