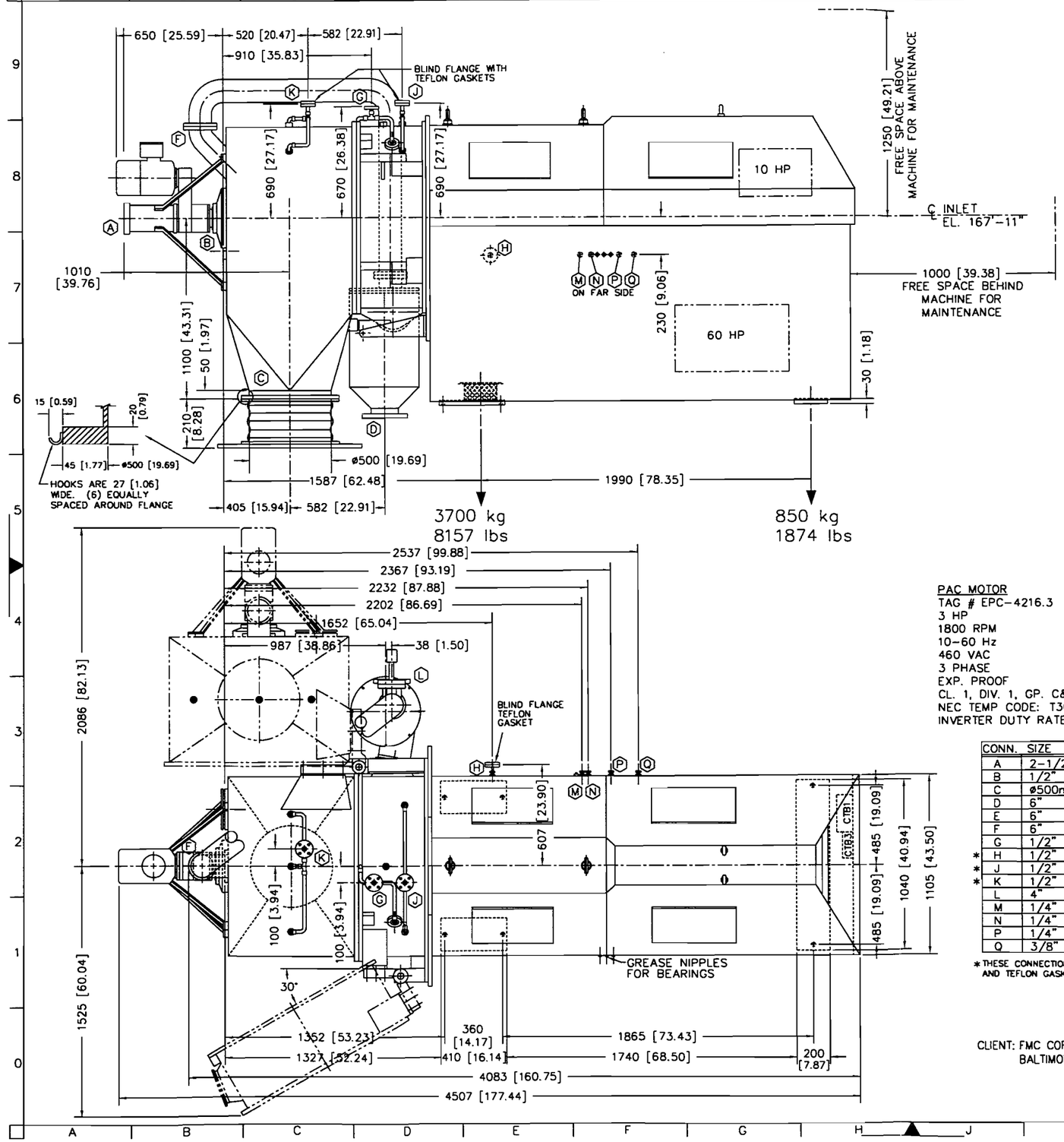
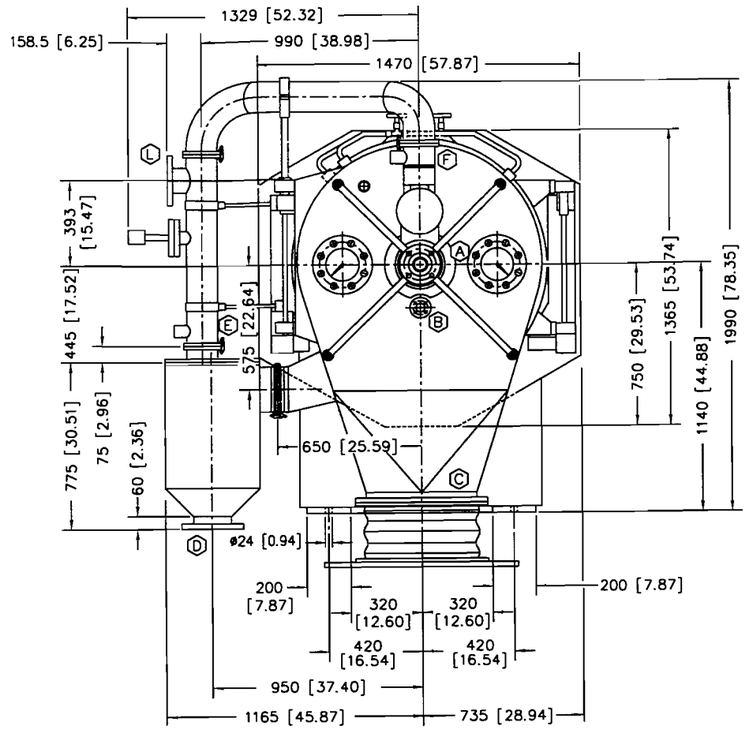




PAC MOTOR
TAG # EPC-4216.3
3 HP
1800 RPM
10-60 Hz
460 VAC
3 PHASE
EXP. PROOF
CL. 1, DIV. 1, GP. C&D
NEC TEMP CODE: T3C
INVERTER DUTY RATED

MAIN DRIVE MOTOR
TAG # EPC-4216.1
60 HP
1800 RPM
10-60 Hz
460 VAC
3 PHASE
EXP. PROOF
CL. 1, DIV. 1, GP. C&D
NEC TEMP CODE: T3C
INVERTER DUTY RATED

AXIAL MOTOR
TAG # EPC-4216.2
10 HP
1800 RPM
10-60 Hz
460 VAC
3 PHASE
EXP. PROOF
CL. 1, DIV. 1, GP. C&D
NEC TEMP CODE: T3C
INVERTER DUTY RATED

	CONN.	SIZE	DESCRIPTION	TYPE
	A	2-1/2"	SLURRY & WASH INLET	ANSI B16.5 150LB R.F.
	B	1/2"	N2 TO SOLIDS HSG.	ANSI B16.5 150LB R.F.
	C	ø500mm	SOLIDS OUTLET (I.D.)	SEE DETAIL 'A'
	D	6"	FILTRATE OUTLET	ANSI B16.5 150LB R.F.
	E	6"	AIR RECIRCULATION	HEINKEL "J" CLAMP
	F	6"	AIR RECIRCULATION	HEINKEL "J" CLAMP
	G	1/2"	N2 TO FILTRATE HSG.	ANSI B16.5 150LB R.F.
*	H	1/2"	BACK BOWL CIP NOZZ.	ANSI B16.5 150LB R.F.
*	J	1/2"	FILTRATE HSG. CIP NOZZ.	ANSI B16.5 150LB R.F.
*	K	1/2"	SOLIDS HSG. CIP NOZZ.	ANSI B16.5 150LB R.F.
	L	4"	VENT CONNECTION	ANSI B16.5 150LB R.F.
	M	1/4"	CONTROL AIR TO BRAKE	N.P.T.
	N	1/4"	N2-TO LABYRINTH	N.P.T.
	P	1/4"	N2-TO BEARING HSG	N.P.T.
	Q	3/8"	N2-PRES MEASUREMENT	N.P.T.

*THESE CONNECTIONS ARE SUPPLIED WITH S.S. BLIND FLANGES AND TEFLON GASKETS

NOTES:
1. CONSTRUCTION: GASTIGHT PER GERMAN DIN 24400
2. MACHINE WEIGHT W/BASE & PANELS: APPROX. 5367 Kg (11833 Lbs)
   - MACHINE WEIGHT: APPROX. 4550Kg (10033Lbs)
   - BASE: APPROX. 635 Kg (1400 Lbs)
   - PAC PANEL: APPROX. 91 Kg (200 Lbs)
   - NITROGEN PANEL: APPROX. 68 Kg (150 IBS)
   - OXYGEN PANEL: APPROX. 23 Kg (50 IBS)
3. MAX. DRUM VOLUME: 119 LITERS
4. MAX. DRUM WEIGHT: 149 Kg (322 Lbs)
5. MATERIALS OF CONSTRUCTION:
   - PRODUCT CONTACTED PARTS: HC 22 (HASTELLOY)
   - PRODUCT CONTACTED SEALS: FEP/PFA
   - BACK END OF MACHINE: DIN 1.4571 (316Ti S.S.)
6. UNBALANCED LOAD = 1400 Kg. CALCULATED WITH 1.5 Kg AT MAX RPM OF 1550. ONLY 5% OF THE LOAD IS TRANSMITTED TO THE PLANT STRUCTURE. 95% IS ABSORBED WITHIN THE MACHINE CONSTRUCTION.
7. PAINT (INTERNAL CARBON STEEL PARTS)
   PRIMER - 2 COATS OF MAGRALON OD (POLYURETHANE BASED)
   FINISH - 2 COATS OF MAGRALON OD (POLYURETHANE BASED)
   COLOR - RAL 5007 BRILLIANT BLUE
8. MACHINE FINISHES:
   INTERNAL - 180/240 GRIT ON ALL SOLIDS CONTACTED PARTS
   BOWL INSERT WELDS - GROUND SMOOTH
9. PREPIPED SPRAY NOZZLES IN SOLIDS AND FILTRATE HOUSINGS
10. AIR CIRCULATION PIPE: HC 22 (HASTELLOY)
11. ALL CONNECTIONS TO THE MACHINE MUST BE FLEXIBLE
12. ALL DIMENSIONS SHOWN IN MILLIMETERS WITH U.S. INCH EQUIVALENTS
13. IMPORTANT: USE ONLY KLUBER NBU15 ISOFLEX GREASE FOR BEARINGS
14. 2000 LB. HOIST REQUIRED OVER THE MACHINE RUNNING THE LENGTH OF THE SHAFT.
15. MAXIMUM ALLOWABLE WORKING PRESSURE (MAWP)= 20" W.C.

93642

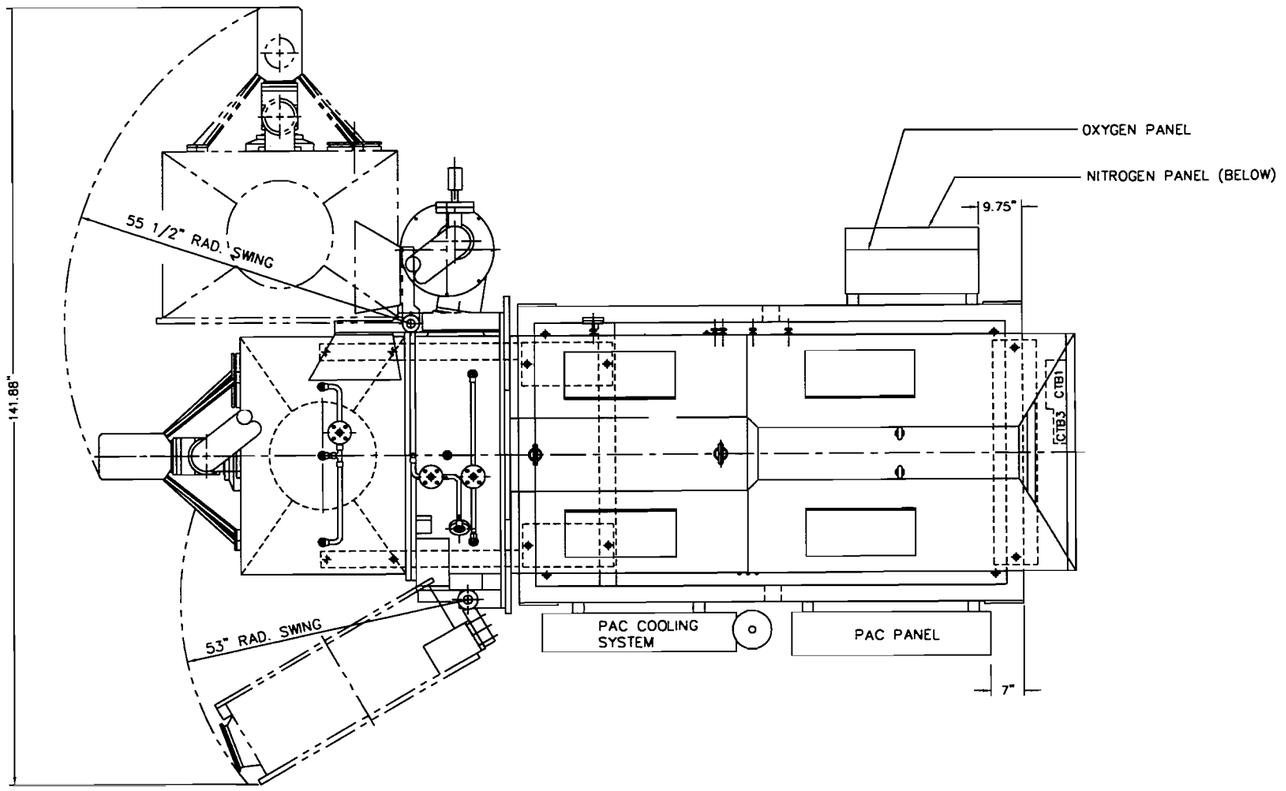
REV	DATE	DESCRIPTION	APPROVED
2	09-10-99	ADDED DIM BETWEEN "C" & "D"	
1	09-01-99	FINAL APPROVAL RELEASED FOR FAB	
0	08-10-99	APPROVED PER CUSTOMER MARK-UPS	
C	08-03-99	VENT LINE CONNECTION "L" WAS 2" FLANGE	
B	08-02-99	RELOCATED VENT CONNECTION	
A	07-13-99	INITIAL RELEASE	

CLIENT: FMC CORPORATION
BALTIMORE, MD

HEINKEL® FILTERING SYSTEMS, INC.
520 Sharptown Rd., P.O. Box 513
Bridgeport, NJ 08014

TITLE
INVERTING FILTER CENTRIFUGE
MODEL HF-800.1
GENERAL ARRANGEMENT

PROJECT NO.: 399.218.8005	DRAWN BY: J.BRISTOW	CHECKED BY:	
MACHINE NO.: 1206/13	SCALE: NONE	APPROVED BY:	
DRAWING NO. MA8005A1			2



#93642

CLIENT: FMC CORP.
BALTIMORE, MD

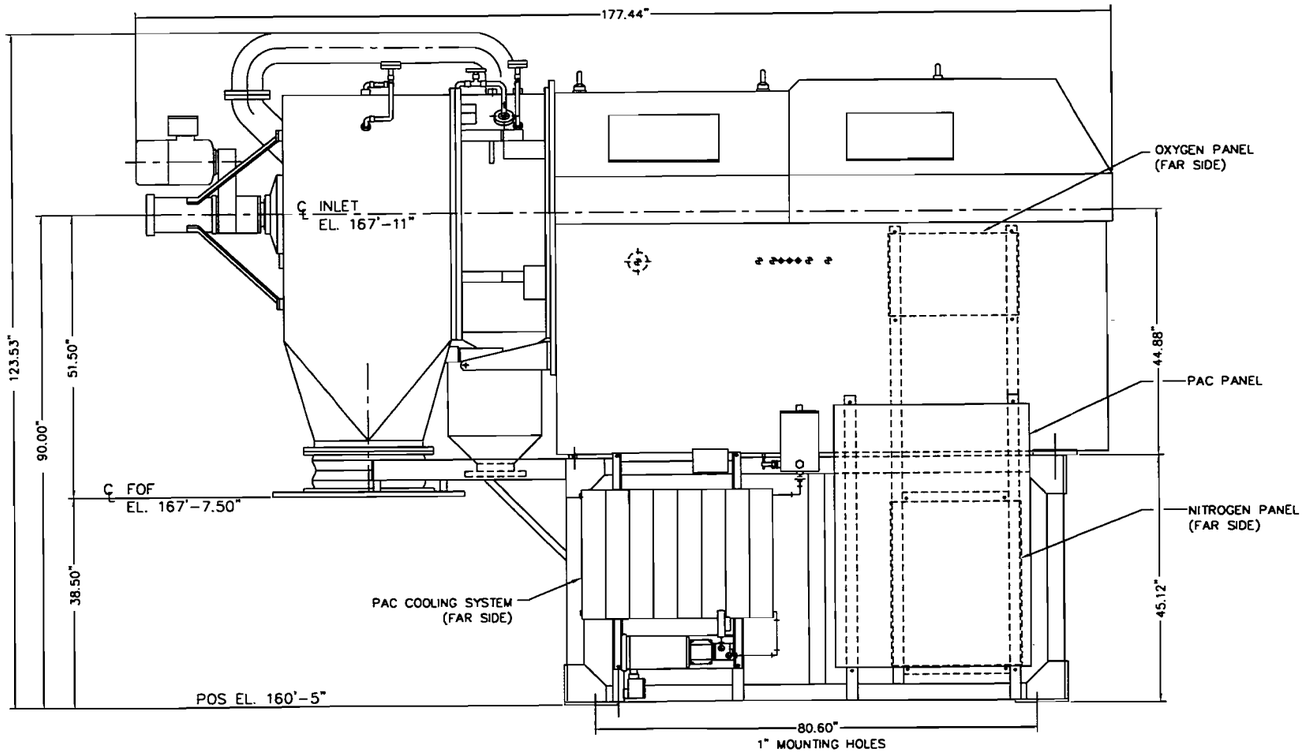
REV.	DATE	DESCRIPTION	APPROVED
1	09-01-99	FIANAL APPROVAL	
0		ORIGINAL ISSUE	

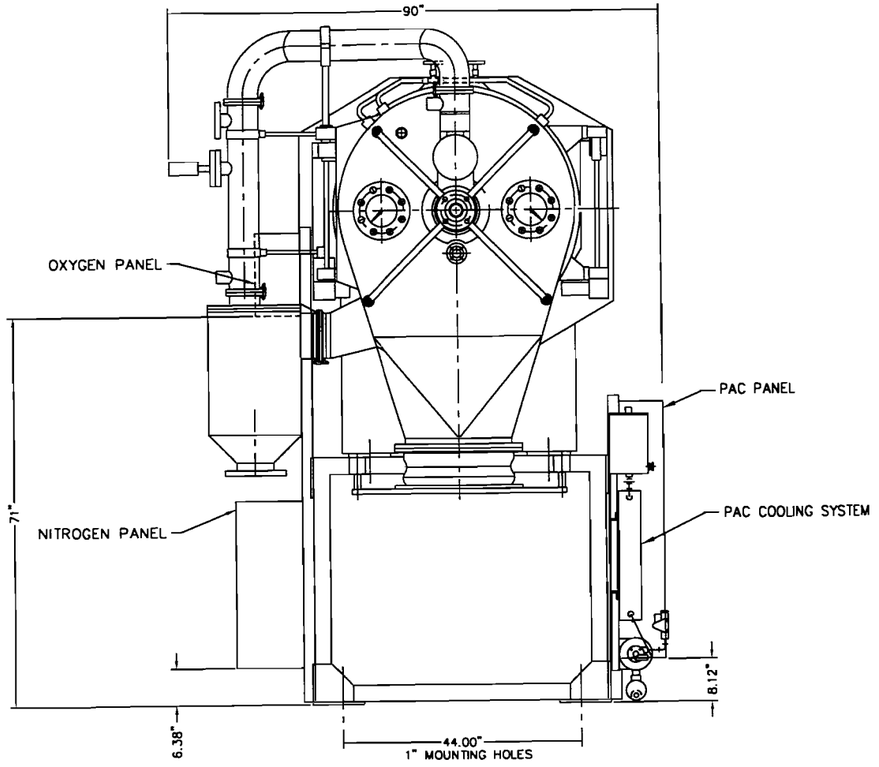
HEINKEL® FILTERING SYSTEMS, INC.
52D Shorptown Rd., P.O. Box 513
Bridgeport, NJ 08014

TITLE: GENERAL ARRANGEMENT
HF-800.1 WITH STAND

PROJECT NO.:	DRAWN BY:	CHECKED BY:
399.218.8005	J.BRISTOW	
MACHINE NO.: 1206/13	DATE: 7-13-99	SCALE: NONE

DRAWING NO. BA8005A2 2 OF 2 | 1





#93642

CLIENT: FMC CORP.
BALTIMORE, MD

REV.	DATE	DESCRIPTION	APPROVED
1	09-01-99	FINAL APPROVAL MOVED PAC COOLING SYSTEM	
0		ORIGINAL ISSUE	

HEINKEL®
FILTERING SYSTEMS, INC.
520 Sharptown Rd., P.O. Box 513
Bridgeport, NJ 08014

TITLE
GENERAL ARRANGEMENT HF-800.1 WITH STAND

PROJECT NO.:	DRAWN BY:	CHECKED BY:
399.218.8005	J.BRISTOW	
MACHINE NO.:	DATE:	SCALE:
1206/13	7-13-99	NONE

DRAWING NO. BA8005A2 1 OF 2 | 1

- The machine is decelerated to the desired discharge speed.

- The axial movement of the bowl insert causes the inversion of the filter cloth and the solids will be forced into the solids housing. There should be no residual solids left on the filter cloth. After a few seconds time delay the bowl insert will be retracted into its closed position. A new cycle can start.

The following are the maximum allowable discharge speeds, however, for extended filter cloth lifetime lower speeds may be necessary.

* #93643

Discharge speeds (RPM)

HF 300.1	HF 450.1	HF 600.1	HF 800.1	HF 1000.1	HF 1300.1
950	550	450	300	250	200

* #93642

6.2. Feed control

The feed control is based on the total weight in the bowl (liquid and solids) utilizing a load cell.

The centrifuge presses via a pivot point (rubber buffer) onto a load cell located at the end of the machine. Before each filling process the weight of the machine is set (tared) to "0". At the same time the feed control transmits a signal to the filling valve and the suspension flows into the drum until the max.weight, which can be selectable, is reached and the fill valve closes again.

Simultaneously a timer is activated. If the min.weight, which is also selectable, is reached before the time set has elapsed, the fill valve reopens until the max. weight causes the valve to close again.

This process can be repeated over and over again until the time set has expired without reaching the minimum weight.

The actual filling weights can be read off on the operators panel.

The max.filling weight depend on the specific weights of the suspension, the mother liquor or the solids to be processed.

The useful drum capacities (liters) are:

HF 300.1	HF 450.1	HF 600.1	HF 800.1	HF 100.1	HF 1300.1
6,5	26	52	120	200	350

6.3. Rotational drive

The rotation results from a frequency controlled electrical motor via V-belts to the centrifuge shaft. Both, the main shaft that the bowl is fixed onto and the axially movable shaft that the drum insert is fixed onto are rotating with the same speed.

The electrical motor is installed on a separate mounting plate with a hinge. The tension of the V-belts can be adjusted by a tightening bolt via the hinge.

The frequency and therefore the speed will be controlled by an inverter panel.

The max. drum speeds (RPM) are: (# 93643

HF 300.1	HF 450.1	HF 600.1	HF 800.1	HF 1000.1	HF 1300.1
3000	2300	1940	1600	1270	1000

(# 93642

6.4. Mechanical axial movement system

The bowl insert moves axially to invert the filter cloth at discharge speed. This is done by a screw drive and a separate variable frequency inverter.

The motor of the axial system via V-belts drives an inner screw with trapezoidal threads. The outer shaft with matching threads is attached to the bowl insert.

By creating a differential speed between the inner screw and outer shaft, the bowl insert will move in the axial direction to invert the filter cloth.

Inherent to this design is an advanced safety package that makes it physically impossible to open the bowl above its rated safety speed.

The motor for the axial movement will be switched off when the bowl is in a totally open or totally closed position. The motor then will turn freely with the same speed as the centrifuge. In order to switch the motor on again the inverter has to be equipped with a frequency search device to insure a smooth start. During closing of the bowl, the motor must brake with its rated torque, which means that the inverter has to have an additional brake package. The brake energy will be dissipated by resistors. Since the braking period is very short, there will be only minimal heat created which makes it possible to put the brake package together with the inverter into the same panel.

Transport weights in kg:

#93643

	HF 300.1	HF 450.1	HF 600.1	HF 800.1	HF 1000.1	HF 1300.1
bowl	32	124	165	310	470	710
drum insert	18	90	120	265	450	650

#93642

9.4. Dismantling of shaft assembly

- Proceed as described in para. 9.1, steps 1-8.
- Remove bowl and drum insert as described in para. 9.3.
- Remove machine covers.
- Remove the axial drive and pulleys.
- Remove the pins located on each side of the bearing housing with the appropriate slide hammer and thread adaptor.
- Take off the V-belts from main drive and disconnect all electrical connections at the terminal box.
- The shaft assembly may be supported from the two eye hook connections provided. Carefully push the shaft back by approx. 10 cm and then remove it from above.
- The complete shaft assembly removed may now be disassembled in a suitable workshop.

Shaft assembly weights in kg:

HF 300.1	HF 450.1	HF 600.1	HF 800.1	HF 1000.1	HF 1300.1
140	400	400	800	1200	1600

2.Description

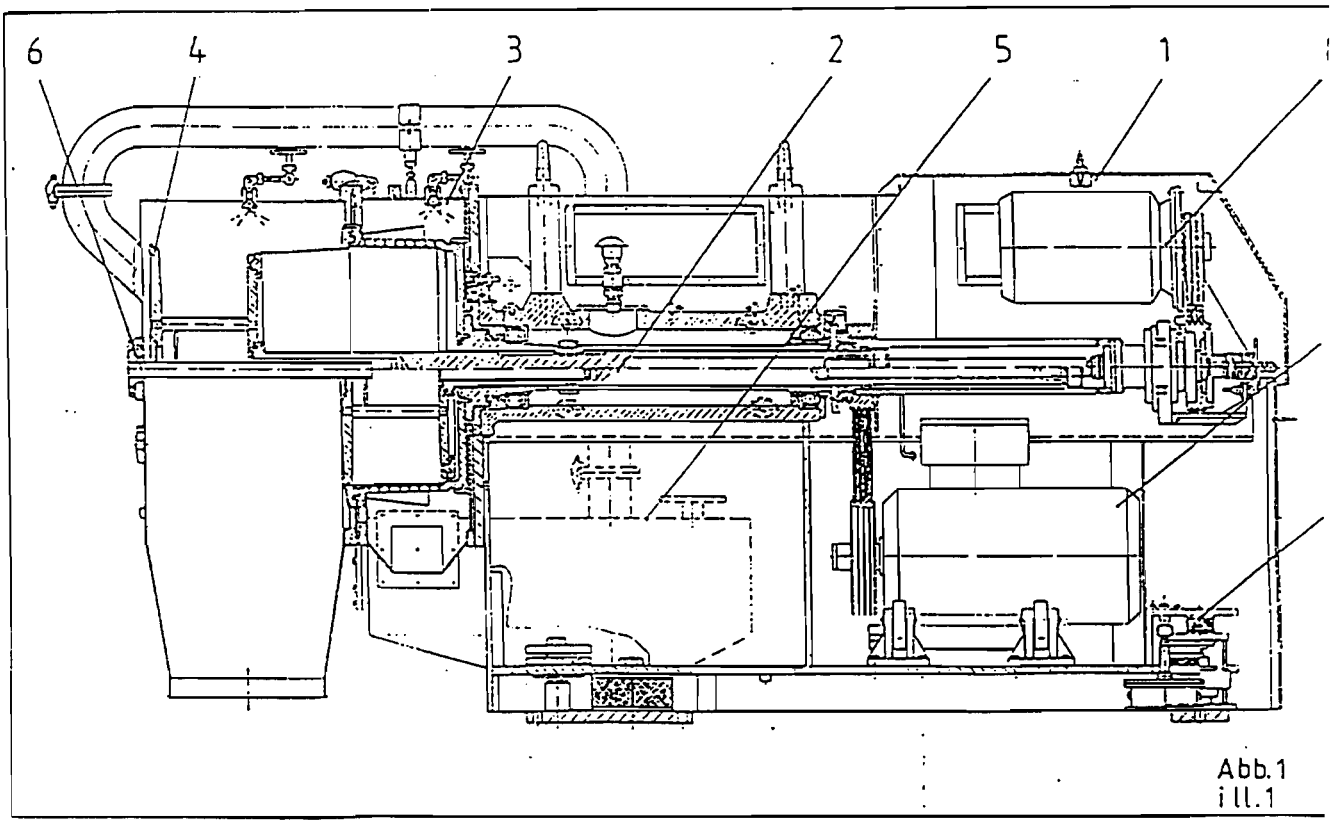
93642
93643

The HEINKEL HF-Inverting Filter Centrifuge is used for separating crystalline, granular, fibrous and amorphous solids from suspensions.

The machine is of simple and sturdy construction, easy to clean and requires little maintenance.

The main assemblies of the machine are (see illustration 1):

(1) Machine frame
(2) Shaft assembly
(3) Filtrate housing and solids housing
(4) Bowl with drum insert
(5) Filtrate/air separator with air circulation pipe
(6) Feedpipe/P·A·C·system
(7) Rotational drive
(8) Drive for axial movement
(9) feed control



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SIEMENS ENERGY & AUTOMATION, INC.
MOTORS & DRIVES DIVISION
ELECTRICAL MOTOR DATA

#93642

CUSTOMER :	HEINKEL FILTERING SYSTEMS
CUSTOMER'S ORDER NO. :	P-3893
SERIAL NO. :	C314840-01
TYPE :	RGZZESD
HORSEPOWER :	60 ←
VOLTAGE :	460
PHASE :	3
HERTZ :	60
FRAME :	365T
SYNC. RPM :	1800
FULL LOAD RPM :	1780
EFFICIENCY :	
1/2	92.8
3/4	94.8
F.L.	94.8
POWER FACTOR :	
1/2	56.3
3/4	76.1
F.L.	82.8
FULL LOAD AMPS :	71
LOCKED ROTOR AMPS :	542
FULL LOAD TORQUE (FT LB) :	177
STARTING TORQUE (FT LB) :	400
BREAKDOWN TORQUE (FT LB) :	530
INSULATION :	F
SERVICE FACTOR :	1.0
AMBIENT TEMP :	40 DEG C

SIEMENS

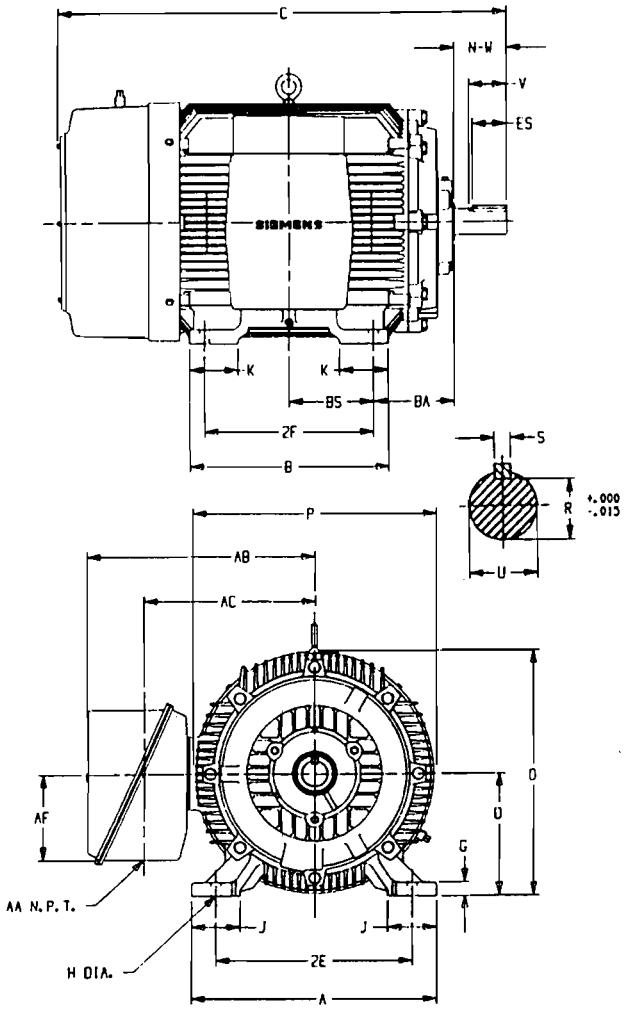
#93642

NEMA Frames Application Manual

Motors & Drives Division

Type RGZSD, RGZESD
Severe Duty, Premium Efficiency Severe Duty
Frames 364T–365TS

Standard Dimensions – In Inches



FRAME	364T	365T	364TS	365TS
A	17.00	17.00	17.00	17.00
B	13.75	13.75	13.75	13.75
C	34.19	34.19	32.06	32.06
D	9.00	9.00	9.00	9.00
2E	14.00	14.00	14.00	14.00
2F	11.25	12.25	11.25	12.25
G	0.94	0.94	0.94	0.94
H	0.66	0.66	0.66	0.66
J	3.12	3.12	3.12	3.12
K	N/A	N/A	N/A	N/A
N-W	5.88	5.88	3.75	3.75
O	17.81	17.81	17.81	17.81
P	17.69	17.69	17.69	17.69
U	2.375	2.375	1.875	1.875
V	5.62	5.62	3.50	3.50
ES	4.25	4.25	2.00	2.00
BA	5.88	5.88	5.88	5.88
BS	6.12	6.12	6.12	6.12
AA (NPT)	3.00	3.00	3.00	3.00
AB	17.94	17.94	17.94	17.94
AC	13.12	13.12	13.12	13.12
AF	7.50	7.50	7.50	7.50
R	2.021	2.021	1.591	1.591
S	0.625	0.625	0.500	0.500
Approx. Ship. Wt. (Lbs.)	840	865	840	865

Footnotes:

(D) Frames 143T–326T +.000–.032
Frames 364T–449T +.000–.062

(S) .188 to .750 +.002–.000
Over .750 to 1.500 +.003–.000

(U) .750 to 1.500 +.000–.0005
Larger than 1.500 +.000–.001

(V) Shaft length available for coupling, pinion or pulley hub.

CERTIFIED PRINT						
CUSTOMER HEINKEL FILTERING SYSTEMS						
P.O. # P3893		S.O. #				
H.P.	R.P.M.	FRAME	TYPE	VOLTS	PH	HZ
60	1800	365T	RGZE ESD	460	3	60
LL PWM 10-60 HZ, XP: I, CFD						
BY: (illegible)		DATE: 8/6/93				

NOT FOR CONSTRUCTION, INSTALLATION OR APPLICATION PURPOSES, UNLESS CERTIFIED