



INSTRUCTION MANUAL

29M FPV - HULL # 93

HIKE METAL PRODUCTS LTD.

CUSTOMER ORDER NO. : 09320

CONTRACT: 91-11605U

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SECTION 1

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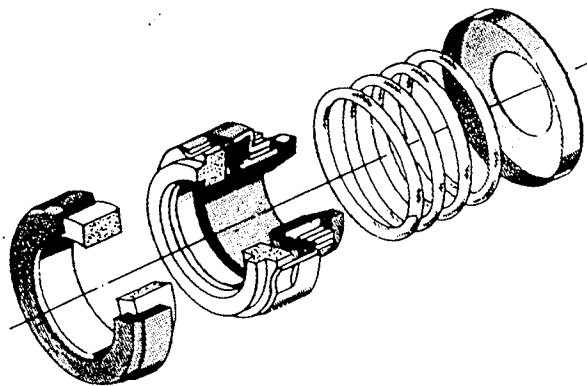
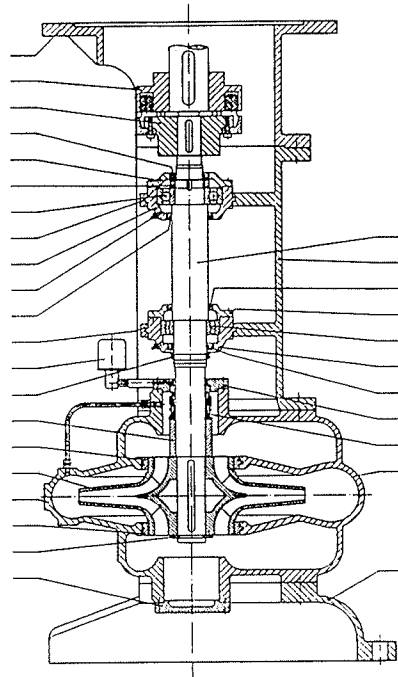
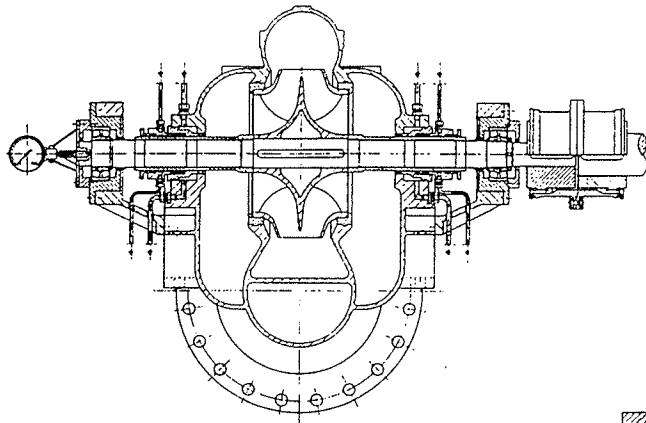
IRON A/S PUMP - RS50-40/125 & RS65-40/160

- MOUNTING AND OPERATING INSTRUCTIONS FOR
IRON A/S PUMPS
- IRON A/S TEST CERTIFICATES
- DRAWINGS

MOUNTING AND OPERATING INSTRUCTIONS FOR PUMPS



MASKINFABRIKEN
IRON A-S
P.O. Box 527
10, Generatorvej
Copenhagen
DK-2730 Herlev
Denmark
Telegrams: Ironarne
Phone: +45 42 91 67 88
Telex: 35 212 Iron DK
Telefax: +45 42 91 16 44



Important: Please read this manual before mounting and starting of pumps.

MOUNTING AND OPERATING INSTRUCTIONS FOR PUMPS

Important: Please read this manual before mounting and starting of pumps.

Check direction of rotation (marked with an arrow).
Check that there is liquid in the pump (might have been emptied by standstill).

Check that the pump is turnable by hand.

Check that the pump has been lubricated with grease.

Check the pump for noises and vibrations immediately after starting.

Check priming pump (if any). See special instructions.

General instructions:

Check the pump immediately after receipt. In case of damages or defects – complain immediately.

All pumps are marked with indication of type and number, stamped into the plate as well as into the pump itself – as for centrifugal pumps, usually in the suction flange – as for other pumps, at an easily visible place.

If the pump is not mounted immediately after receipt it should be protected during storage (see Storage instructions).

Mounting instructions:

When calculating the piping system, special regard should be paid to minimizing pressure losses in the suction line (short pipe lengths, large diameter, few bendings, no valves). If valves are necessary, then use valves with min. pressure losses, e.g. slide valves, butterfly valves, flap non-return valves etc.

Static suction lift + total pressure losses in suction line + NPSH value of the pump + steam pressure of the liquid must not exceed 10 m WC at sea level (and 760 mm Hg).

For pumps delivered without motor:

Mounting of coupling parts:

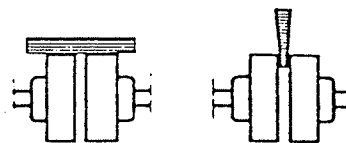
Before mounting, shaft and coupling parts must be carefully cleaned. Grease shaft ends and check that key fits. Heat coupling parts to 70°C and push them on to the shaft ends by hand or by a light pressure. By dismounting a puller will have to be applied.

Alignment of couplings:

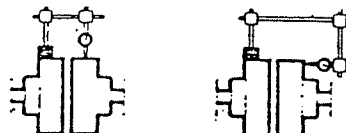
Flexible couplings will absorb small deviations in the relative positions of the shaft ends to be connected, however, a careful and accurate alignment will prolong the life of the coupling flexibles. When aligning the coupling halves the parallel and angular accuracy should be as great as possible. Alignment must be carried out in two axial planes at right angles (see sketch).

A perfect alignment can be achieved by means of a straight-edge (axial parallelism) and a feeler gauge (squareness) or by means of an indicator, as shown in below figures. The coupling clearance must be

within 2-6 mm according to the size of the coupling.



Alignment of coupling parts by means of straight-edge and feeler gauge.



Alignment of coupling parts by means of indicator.

Installation of the pump:

The entire piping must be pressure tested and flushed clean before it is connected to the suction and discharge side of the pump. If the pressure test takes place with the pump installed the testing pressure must not exceed the testing pressure of the pump, which is stamped into the pump, usually in the suction flange. Otherwise, the pump packings or flanges for the mechanical shaft seal might be damaged. Connection of the pipes to the pump must take place without using force as this might interfere with the alignment of the pump.

Precautions must be taken to ensure that the pipe connections to the pump are supported in a way that prevents tensions from being transmitted to the pump, e.g. owing to thermal expansion. Check that all other connections to the pump are in working order, such as lubrication, priming, heating, cooling medium outlet, etc., and that the various measuring equipment has been correctly connected. Take care that no parts obstruct the easy access to the pump for inspection or replacement of important parts. For pumps with axially split casing there should be sufficient space for dismounting the top part of the pump casing.

Motor wiring:

Electric motors should be connected by means of sufficiently long cables to permit the motor to be moved a little without dismantling the connections. A control unit (emergency stop) should be installed close to the pump.

Motor-driven pumps (diesel):

When using pumps driven by internal combustion engines vibrations may occur in the system. It is recommendable to mount the unit on vibration dampers and to install compensators between pump and pipelines. The calculation of vibration dampers should be left to specialized companies.

In-line pumps, type CNH with spacer coupling, can also be disassembled without removing motor and pipe connections. First the intermediate piece between the coupling elements is dismounted, then the pump cover with the rotating element can be lifted out for inspection. In the smaller types of these pumps, CNL and CNLB, the motor with pump cover and rotating element is removed as one unit. In horizontal, self-priming pumps, type RSM and RS, the impeller can be inspected after removing the inspection cover. In type RSM the rotating element can be taken out after removing the rear cover with motor, and in type RS after removing the rear cover and the bearing bracket. To both pump types it applies that it is not necessary to dismount the pipe connections.

As for other pump types, it is necessary to remove the pipe connections in order to inspect the interior parts of the pump.

Assembling instructions:

When assembling the pump the mechanical seal must be treated with the greatest care. Take care that the various parts are placed correctly. The rubber bellows is mounted on the shaft by means of grease, which gives approx. two hours respite before the bellows jams on the shaft. This means that within this period it can be displaced when the packing flange is clamped by means of two or four nuts. Otherwise, the mechanical seal might be damaged. Before mounting the O-rings (if any) they must be cleaned and provided with a thin layer of grease. For further information see instructions for mechanical seal.

The following packings are used:
between covers for ball bearings housing:
0,30 mm paper packing
between packing flanges and pump casing:
0,75 mm »MINTEX«
between pump casing top part and bottom part:
1,00 mm »KLINGERIT«
or
between pump casing and cover:
1,00 mm »KLINGERIT«

In such places where liquid packing has once been used this type of packing must be used again when remounting the pump, as other types of packing would produce wrong spaces.

Mounting of motors on direct-coupled pumps (e.g. the types CHVM, CNL, RSM):

If the pump is delivered without motor a distance ring is mounted between the packing flange and the shaft. This ring must not be removed until the motor has been mounted and the pump shaft screwed together with the motor shaft. Do not forget to remove the ring before starting the pump!

Pumps with split casing:

When mounting the rotating element in the pump, take care that the tongue of the case wear rings fits correctly in the groove of the pump casing. The bolts of the pump casing must be tightened with a factor of 6,0 kgm, the bolts of the bearing housings with a factor of 3,0 kgm.

When reassembling pumps, take care that impellers, as regards the vanes, have the same direction of rotation as before the disassembling.

Faults

A. Pump and motor cannot be actuated:

B. Motor running but no pumping effect:

C. Insufficient capacity:

Possible causes

1. Impeller or shaft blocked.
2. Motor fault.

1. Motor rotation is not transmitted through coupling.
2. Discharge valve closed.
3. Non-return valve or other valves are closed.
4. Suction line closed or filter clogged.
5. Air in pump casing.
6. Suction line leaking.
7. Shaft seal leaking.
8. Bottom valve defective.
9. Suction lift too high.
10. Priming pump defective.

1. Wrong direction of rotation.
2. Number of revolutions too low.
3. Counter-pressure too high.
4. Suction line or impeller partly clogged.
5. Air in pump casing.
6. Air in pumping medium.
7. Suction lift too high (inlet pressure too low).
8. Cavitation.
9. Suction line leaking.
10. Shaft seal leaking.
11. Pump worn out.

O. Stark vibrations:

1. Foreign bodies in pump.
 2. Motor out of balance.
 3. Other influences.
-

Maintenance (Storage instructions):

General instructions:

All pumps which are taken out of operation for some time should be protected against corrosion and frost and kept in a dry place. The following directions should be observed:

Preservation of bearings:

Both ball/roller bearings and slide bearings should be lubricated all over with their normal lubricant.

Preservation of interior parts of the pumps:

The interior parts of the pumps should be protected against aggressive pumping media, for instance by using a water-repelling solvent containing at the same time corrosion inhibiting nitrides. We recommend »MOBIL OIL – ARMA 245« or similar quality.

Preservation of gear wheel pumps and gearboxes:

Gear wheel pumps do not need any protection if they have been operating with oil products. If not, they should be lubricated all over with a neutral oil. Gearboxes should be completely filled with the oil

specified. If the standstill lasts longer than 12 months the oil should be emptied and replaced by »MOBIL ARMA 25« or similar quality or the gearbox should be flushed with this oil.

Preservation procedure:

Flush the pump with pure, hot water (does not apply to screw pumps and gear pumps) and let it air-dry. Close the valves on both sides of the pump and flush the pump with »MOBIL ARMA 25« or similar quality. Flushing can take place through the manometer connections.

Restarting of the pumps:

When restarting pumps it is advisable to fill the pump with hot water through the manometer connections (does not apply to screw pumps and gear wheel pumps) and to turn the pump shaft by hand before starting the pump. Watch the operation of the pump for abt. 10 minutes and open the valve in the normal way. Bearings, gearboxes etc. should be lubricated with normal oil or grease if a change of oil has taken place.

American Bureau of Shipping

DATE 25th NOVEMBER 1991

REPORT NO. 91MO1054	REPORT ON ONE(1) Rotary Transfer Pump	PORT OF MONTREAL/CANADA
CERTIFICATE NO. -		INTENDED FOR: Patrol Boat
VESSEL'S NAME -	SHIPBUILDER Hike Metal Product Co.Ltd., Wheatly, Ont	SHIPYARD HULL NO. -
VESSEL'S I. D. NUMBER -	ENGINE OR BOILER BUILDER -	SERIAL NO. 51-842
SURVEYOR'S STAMPING A B MO1054 JA 25-11-91.	OWNER Department of Fisheries & Ocean Ottawa	OWNER'S CONTRACT NO. -
	PURCHASER Hike Metal Product Co. Ltd. Wheatly, Ont.:	PURCHASER'S ORDER NO. 09320
ACCEPTED DATE 25-11-91.	MANUFACTURED BY Iron A/S	MANUFACTURER'S NO. -
MATERIAL TESTED -	SERVICE USE Fuel Oil Transfer Pump	WEIGHT (AND CONDITION) -
HEAT TREATMENT -	PROCESS OF MANUFACTURE Assembled on site	H. P. (IF ANY) 3/4
	DRAWING NO. AND DATE APPROVED	W. P. (IF ANY) 11 P.S.I.

This is to certify that the undersigned Surveyor to this Bureau did, at the request of M/S Plad Equipment Ltd. attend their plant at 2315 Halpern St. Laurent, Que. on the 25th day of November 1991 and subsequent dates in order to examine and report on ONE(1) Rotary Transfer Pump manufactured according to Manufacturer's Specifications and to the Rules of this Bureau.

Details, Special Inspections, etc.:

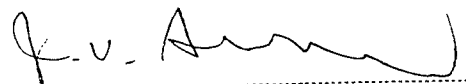
Transfer Pump
Model RS50-40/125
Serial No 51-842 : RPM 1725
Rated capacity 26 USG/Min. at 26 Ft. discharge head

The pump was subject to capacity test over the range from 0 to rated capacity with a calibrated mag meter. All parameters were noted to be according to specification and considered satisfactory. The pump was hydrostatically tested to Rule Requirement and found satisfactory

Hydrostatic Tests: 65 P.S.I.

Billed To: Plad Equipment Ltd.
2315 Halpern
St. Laurent, Que.
Invoice No. and Date 1545830163 - 2 DEC. 1991.
1st Visit AND Last Visit 25 NOV. 1991.
Fees No. of Visits ONE(1)
Expenses Time Involved -
TOTAL

Distribution	CLIENTS	-2
	ABS.HOUSTON	-1
	ABS.CLVD.	-1
	FILE	-1



J.V. APPOO SENIOR Surveyor

NOTE: This Report evidences compliance with one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping and is issued solely for the use of the Bureau, its committees, its clients or other authorized entities. This Report is a representation only that the structure, item of material, equipment, machinery or any other item covered by this Report has been examined for compliance with, or has met one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping. The validity, applicability and interpretation of this Report is governed by the Rules and standards of American Bureau of Shipping who shall remain the sole judge thereof. Nothing contained in this Report or in any notation made in contemplation of this Report shall be deemed to relieve any designer, builder, owner, manufacturer, or any other party of any warranty express or implied.

American Bureau of Shipping

DATE: 25th November 1991

REPORT NO. 01M01055	REPORT ON One(1) diesel driven Centrifugal Pump	PORT OF Montreal/Canada
CERTIFICATE NO.	INTENDED FOR: Patrol Boat	
VESSEL'S NAME	SHIPBUILDER Hike Metal Product Co.Ltd. Wheatly, Ont.	SHIPYARD HULL NO. -
VESSEL'S I. D. NUMBER	ENGINE OR BOILER BUILDER	SERIAL NO. 51-841
SURVEYOR'S STAMPING A B M01055JA 25-11-91	OWNER Department of Fisheries & Ocean Ottawa	OWNER'S CONTRACT NO.
	PURCHASER Hike Metal Product Co. Ltd.	PURCHASER'S ORDER NO. 09320
	MANUFACTURED BY Iron A/S	MANUFACTURER'S NO. -
ACCEPTED DATE 25-11-91	SERVICE USE Emergency Fire Pump	WEIGHT (AND CONDITION) -
MATERIAL TESTED	PROCESS OF MANUFACTURE	H. P. (IF ANY) 4.1 HP.
HEAT TREATMENT	DRAWING NO. AND DATE APPROVED	W. P. (IF ANY) 45 P.S.I.

This is to certify that the undersigned Surveyor to this Bureau did, at the request of M/S Plad Equipment Ltd. attend their plant at 2315 Halpern, St. Laurent on the 25th day of November 1991 and subsequent dates in order to examine and report on One (1) diesel driven centrifugal pump manufactured according to Manufacturer's specifications and to the Rules of this Bureau.

Details, Special Inspections, etc.:

Emergency Fire Pump
Model RS50-40/125
Serial NO 51.841 : RPM 3400
Rated Capacity 66 USG/Min at 98 Ft. discharge head.

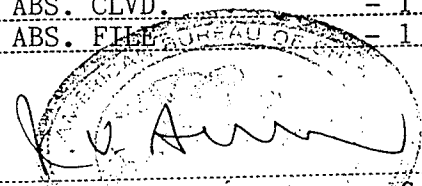
The pump was subjected to capacity test over the range from 0 to rated capacity with a calibrated mag meter. All parameters were noted to be according to specification and considered satisfactory. The pump was hydrostatically tested to Rule Requirement and found satisfactory.

NOTE: Maximum 3000 R.P.M. Obtained during test.

Hydrostatic Tests: 90 P.S.I.

Billed To: Plad Equipment Ltd.
2315 Halpern
St. Laurent, Quebec
Invoice No. and Date. 1545830164 - 2 December 1991
1st Visit & Last Visit 25 November 1991
Fees No. of Visits ONE(1)
Expenses Time Involved
TOTAL

Distribution CLIENT - 2
ABS. HOUSTON - 1
ABS. CLVD. - 1
ABS. FLEET BUREAU OF - 1


J. V. APPOO Sr. Surveyor

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American Bureau of Shipping

DATE.....25th November 1991.....

REPORT NO. 91M01056	REPORT ON ONE (1) Centrifugal Pump	PORT OF MONTREAL/CANADA
CERTIFICATE NO. -	INTENDED FOR: Patrol Boat	
VESSEL'S NAME -	SHIPBUILDER Hike Metal Products Co. Ltd. Wheatly, Ont.	SHIPYARD HULL NO. -
VESSEL'S I. D. NUMBER -	ENGINE OR BOILER BUILDER -	SERIAL NO. 51840
SURVEYOR'S STAMPING *A B 1056JA 25-11-91	OWNER Department of Fisheries & Ocean/Ottawa	OWNER'S CONTRACT NO. -
	PURCHASER Hike Metal Products Co. Ltd., Whitly, Ont.	PURCHASER'S ORDER NO. 09320
ACCEPTED DATE 25-11-91	MANUFACTURED BY Iron A/S	MANUFACTURER'S NO. -
MATERIAL TESTED -	SERVICE USE Bilge & Fire Lines	WEIGHT (AND CONDITION) -
HEAT TREATMENT -	PROCESS OF MANUFACTURE Assembled on site	H. P. (IF ANY) 10 H.P.
	DRAWING NO. AND DATE APPROVED -	W. P. (IF ANY) 15 P.S.I.

This is to certify that the undersigned Surveyor to this Bureau did, at the request of M/S. Plad Equipment Ltd. attend their plant at 2315 Halpern, St. Laurent, Que. on the 25th day of November 19 91 and subsequent dates in order to examine and report on One (1) Centrifugal pump manufactured according to Manufacturer's Specifications and to the Rules of this Bureau.

Details, Special Inspections, etc.:

Bilge and Fire Pump
 Model No. RS 65-50/160
 Serial NO 51840
 Rated capacity 105 USG/Min. at 32 FT. discharge head at 3500 r.p.m.

The pump was subjected to capacity test over the range from 0 to rated capacity with a calibrated mag meter. All parameters were noted to be according to specification and considered satisfactory. The pump was hydrostatically tested to Rule Requirement and found satisfactory.

Hydrostatic Tests: 65 P.S.I.

Billed To: Plad Equipment Ltd.
 2315 Halpern
 St. Laurent, Que. H4S 1S3
 Invoice No. and Date 1545830169 - 22nd Dec. 91.
 1st Visit AND Last Visit 25th November 1991
 Fees No. of Visits ONE (1)
 Expenses Time Involved
 TOTAL

Distribution CLIENT - 2
 ABS. HOUSTON - 1
 ABS. CLVD. - 1
 FILE - 1

J.V. Apou
 J.V. APPO - Sr. Surveyor

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American Bureau of Shipping

DATE 25th November 1991

REPORT NO. 91M01057	REPORT ON ONE(1) Centrifugal Pump	PORT OF MONTREAL/CANADA
CERTIFICATE NO. -		INTENDED FOR: Patrol Boat
VESSEL'S NAME -	SHIPBUILDER Hike Metal Products Co. Ltd., Wheatly, Ont.	SHIPYARD HULL NO. -
VESSEL'S I. D. NUMBER -	ENGINE OR BOILER BUILDER	SERIAL NO. 51839
SURVEYOR'S STAMPING ✱ A B M01057JA 25-11-91.	OWNER Dept. of Fisheries & Ocean - Ottawa	OWNER'S CONTRACT NO. -
	PURCHASER Hike Metal Products Co. Ltd. Wheatly, Ont.	PURCHASER'S ORDER NO. 09320
ACCEPTED DATE 25-11-91	MANUFACTURED BY Iron A/S	MANUFACTURER'S NO. -
MATERIAL TESTED -	SERVICE USE Bilge and General Service	WEIGHT (AND CONDITION) -
HEAT TREATMENT -	PROCESS OF MANUFACTURE Assembled on Site	H. P. (IF ANY) 3 H.P.
	DRAWING NO. AND DATE APPROVED	W. P. (IF ANY) 16 P.S.I.

This is to certify that the undersigned Surveyor to this Bureau did, at the request of M/S Plad Equipment Ltd. attend their plant at 2315 Halpern St. Laurent on the 25th day of November 1991 and subsequent dates in order to examine and report on One (1) Centrifugal Pump manufactured according to Manufacturer's specifications approved plans and to the Rules of this Bureau.

Details, Special Inspections, etc.:

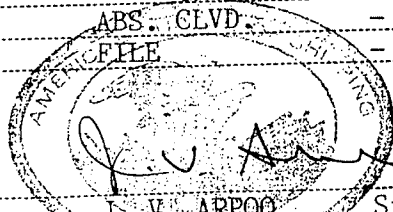
Bilge and General Service Pump
 Model RS 65-50/160
 Serial No 51839
 Rated capacity 105 USG/MIN. AT 38 FT. discharge head at 1725 RPM.

The pump was subjected to capacity test over the range from 0 to rated capacity with a calibrated mag meter. All parameters were noted to be according to specification and considered satisfactory. The pump was hydrostatically tested to Rule Requirement and found satisfactory.

Hydrostatic Tests: 65 p.s.i.

Billed To: Plad Equipment Ltd.
 2315 Halpern
 St. Laurent, Que. H4S 1S3
 Invoice No. and Date 1545830170 - 12th December 1991
 1st Visit AND Last Visit 25th Nov. 91.
 Fees No. of Visits ONE
 Expenses Time Involved -
 TOTAL

Distribution CLIENT - 2
 ABS HOUSTON - 1
 ABS CLVD - 1
 AMERICAN BUREAU OF SHIPPING - 1



J. V. APPOG Sr. Surveyor

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REPORT ALL ERRORS OR CHANGES
TO ENGINEERING DEPT.

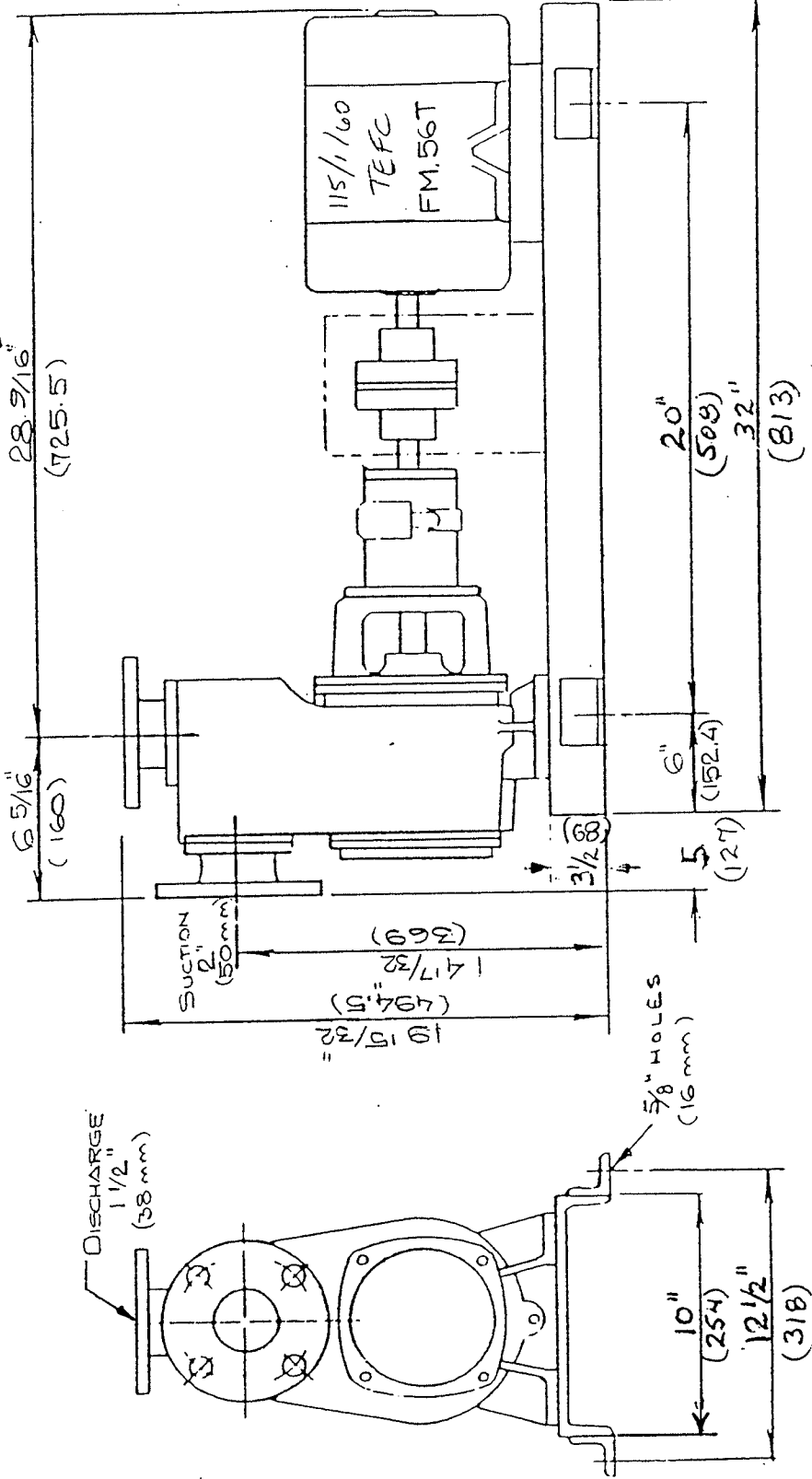
FILE NO.
A-3243

FRESH WATER TRANSFER PUMP (TYPICAL)

PLAD EQUIPMENT CO. LTD.
MONTREAL, QUE.

CERTIFIED

BY *Dez* DATE *2/08/12*



weight = 95 kg

PUMPS & POWER LIMITED
VANCOUVER, CANADA

IRON A/S RS 50-40/12.5 SELF-PRIMING
PUMP DRIVEN BY 3/4HP. 1725 RPM MOTOR

DRAWN BY: *E.A.L.*
CHECKED BY: *[Signature]*

SCALE: *NS*
DWG. NO. *[Number]*

REPORT ALL ERRORS OR CHANGES
TO ENGINEERING DEPT.

FILE NO.
A-3457

EMERGENCY
BILGE / FIRE PUMP
- ENGINE DRIVEN

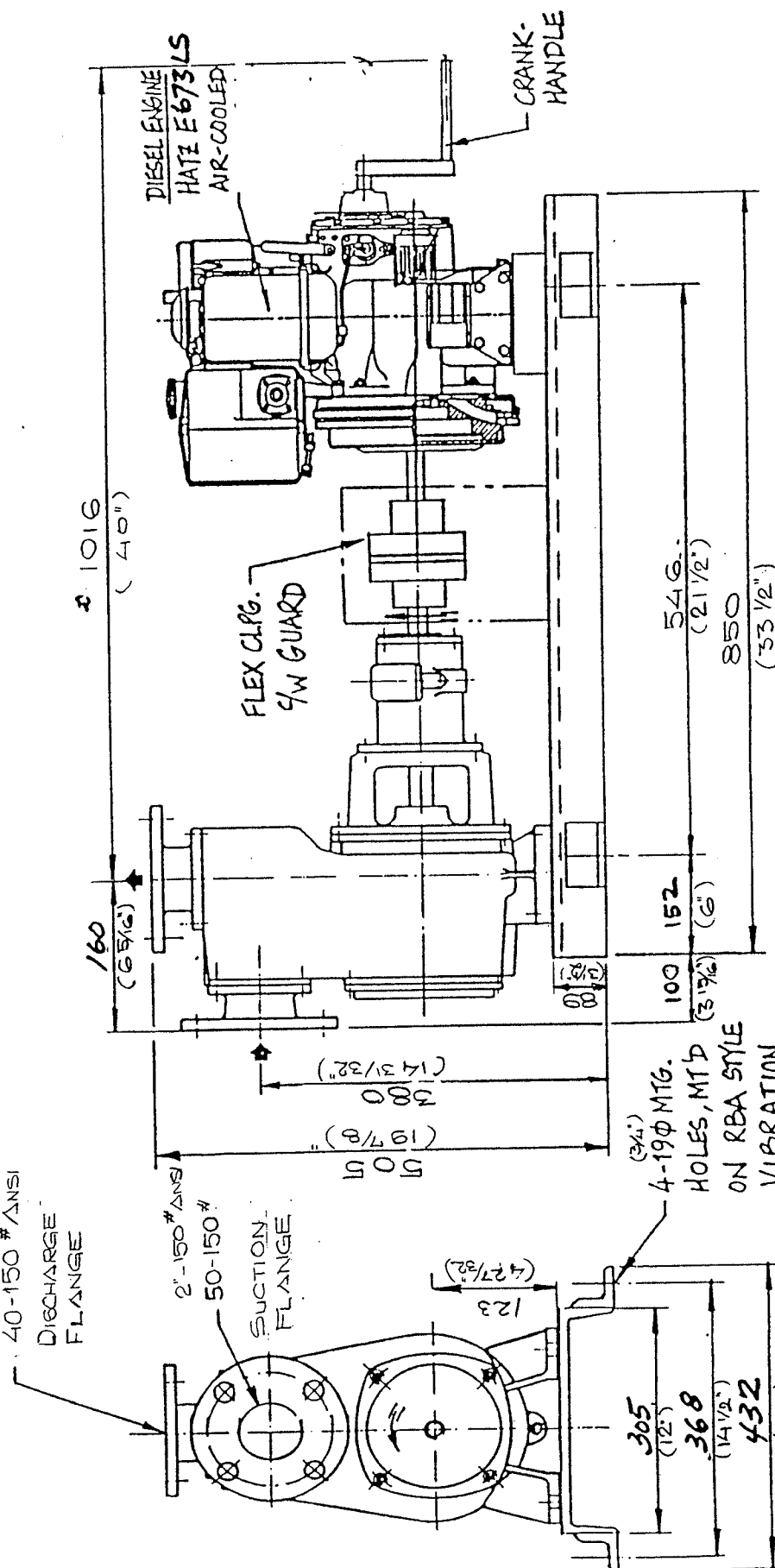
PLAD EQUIPMENT CO. LTD.
MONTREAL, QUE.

CERTIFIED

BY *[Signature]* DATE *2/10/81*

1/2" - 150 #
40-150 # ANSI
DISCHARGE
FLANGE

2" - 150 # ANSI
50-150 #
SUCTION
FLANGE



ALL DIMENSIONS IN MM
EST. WT. = 125kg

DRAWN BY: AH
CHECKED BY: DH
APP 19/10/81

SCALE: N.T.S.
DWG. NO. 1 A-3457

PARAMOUNT / IRON A/S RS 50-40/25 (2 1/2")
GALV HATZ F673LS AIR-COOLED DIESEL ENGINE

PUMPS & POWER LIMITED
VANCOUVER, CANADA

FILE NO.
A-3244

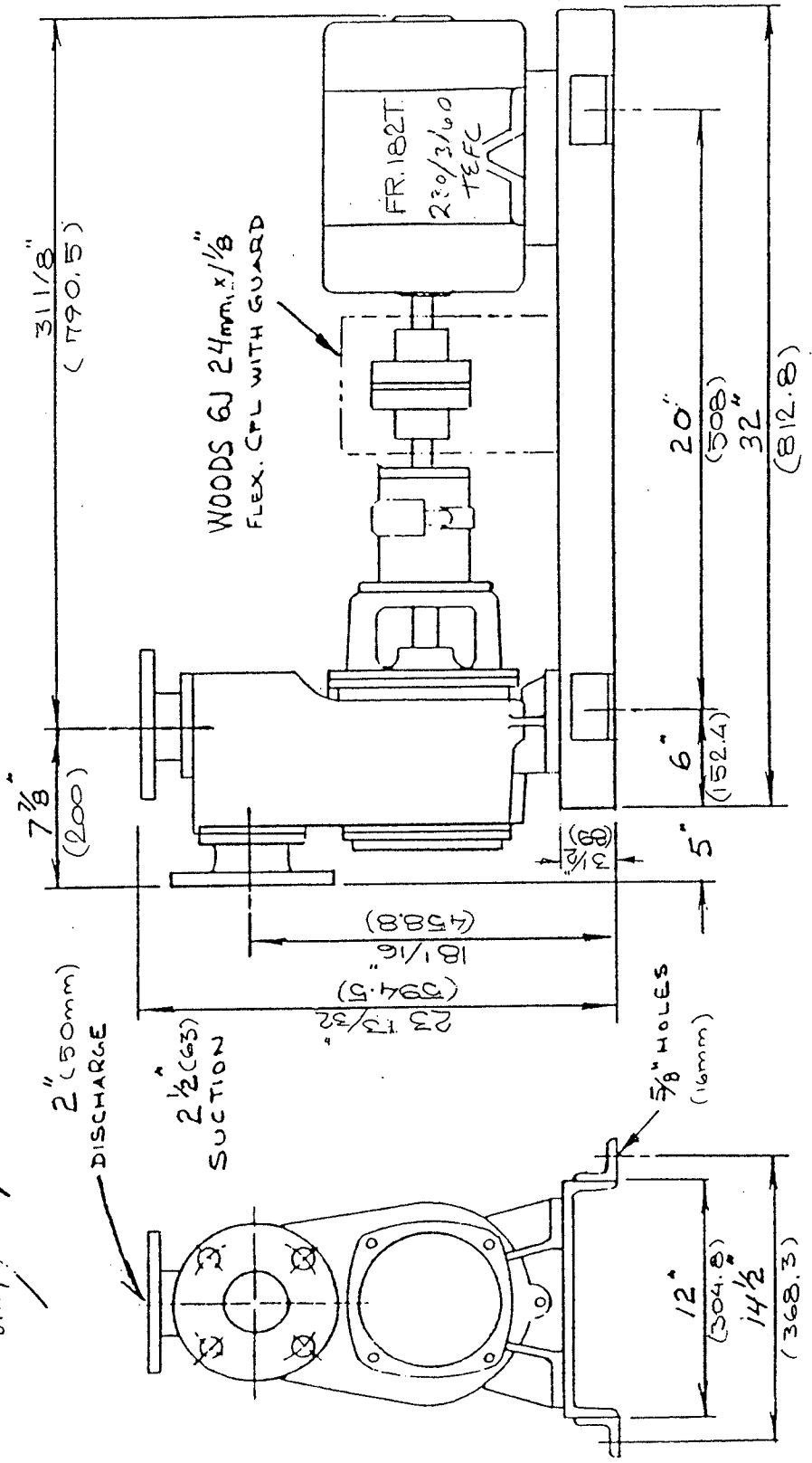
REPORT ALL ERRORS OR CHANGES
TO ENGINEERING DEPT.

BIDGE PUMP UNIT (TYPICAL)

PLAD EQUIPMENT CO. LTD.
MONTREAL, QUE.

CERTIFIED

BY: *[Signature]* DATE: 9/28/62



weight: $\approx 145\text{kg}$

<p>PUMPS & POWER LIMITED VANCOUVER, CANADA</p>	<p>IRON A/S RS65-50/160 SELF-PRIMING PUMP DRIVEN BY 2 HP 1800 RPM MOTOR</p>	<p>DRAWN BY: <u>ESAL</u> CHECKED BY: _____</p>	<p>SCALE: <u>1/5</u> PUMP NO. _____</p>
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FILE NO.
A-3248

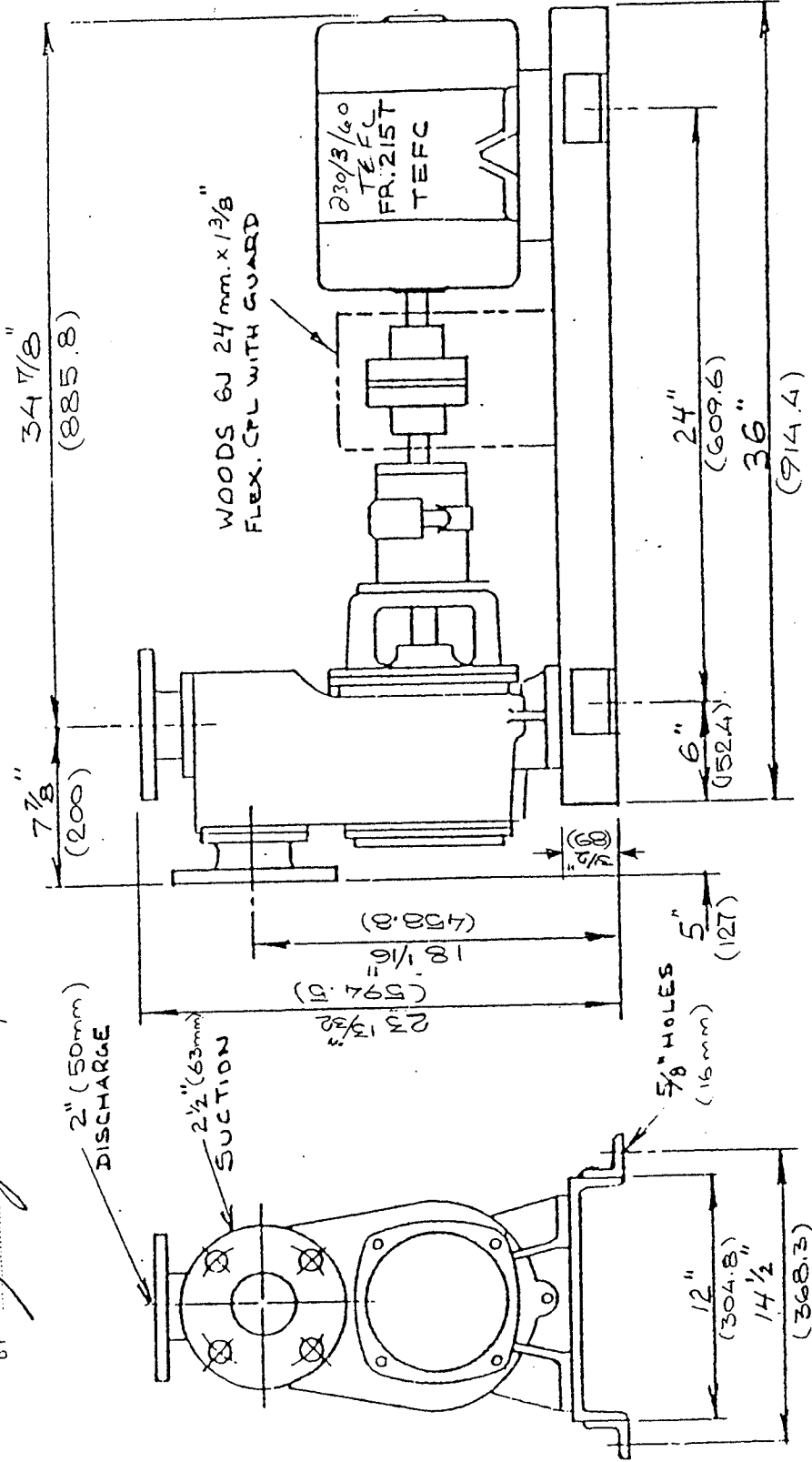
REPORT ALL ERRORS OR CHANGES
TO ENGINEERING DEPT.

Bilge/Fire Pump Unit (Typical)

PLAD EQUIPMENT CO. LTD.
MONTREAL, QUE.

CERTIFIED

BY *D.J.* DATE *9/1/84*



wght. \approx 180kg

PUMPS & POWER LIMITED VANCOUVER, CANADA	IRON A/S RS 65-50/160 SELF-PRIMING PUMP 10 HP 3600 RPM MOTOR	DRAWN BY: <u>EA</u>	SCALE: NTS
		CHECKED BY: <u>JAN 5 1982</u>	DWG. NO. <u>A-3248</u>