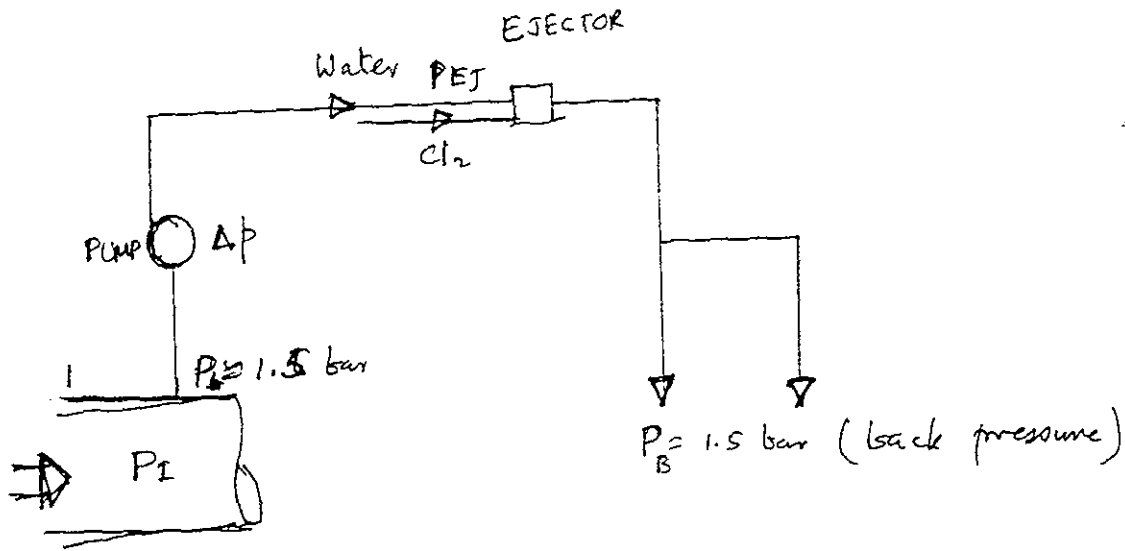


**MALIGAKANDA / ELLIE HOUSE RESERVOIRS -
CHLORINATORS**

GAS CHLORINATORS - MALIGAKANDA



Estimated
~~#~~ Chlorine dosage in yr. 2010:

At max. peak hourly flow : $27.5 \text{ kg/day} = 1.146 \text{ kg/hr}$
 At ~~average~~ maximum average flow : $17.2 \text{ kg/day} = 0.717 \text{ kg/hr.}$

Chlorination system is designed to cope up with max peak hourly flow. i.e. 1.146 kg/hr.

Typical selection:

ECOMETRICS : Model 2175 C Chlorine
 SERIES | | |
 Max. capacity 2 kg/hr (100 ppd) | | |
 Available Flow meter 2 kg/hr | | |
 Manifold w/o with auto swit

(*) Reference: Nozzle sizing chart, 100 ppd.

At back pressure of 1.5 bar (21.75 psi)
 (P_{ES}) Ejector inlet pressure = 65 psi = 4.48 bar
 (Q) Ejector inlet flow = 7.4 gpm (us)

Hence the Δp to be ~~gr~~ created by pump

$$\begin{aligned}\Delta p &= 4.48 - 1.5 \text{ bar} \\ &= 2.98 \text{ bar} \\ &\approx 30 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Nominal Flow rate} &= 7.4 \text{ US gpm} \\ \text{with extra 25\%} &= 9.25 \text{ US gpm} \\ (\times 3.785) &= 35.01 \text{ Ltr/min} \\ &= 2100 \text{ L/hr.} \\ &= 2.1 \text{ m}^3/\text{hr}\end{aligned}$$

Hence the head and capacity of motive water pump.

$Q - 2.1 \text{ m}^3/\text{hr.}$
$H - 30 \text{ m}$

Typical selection:

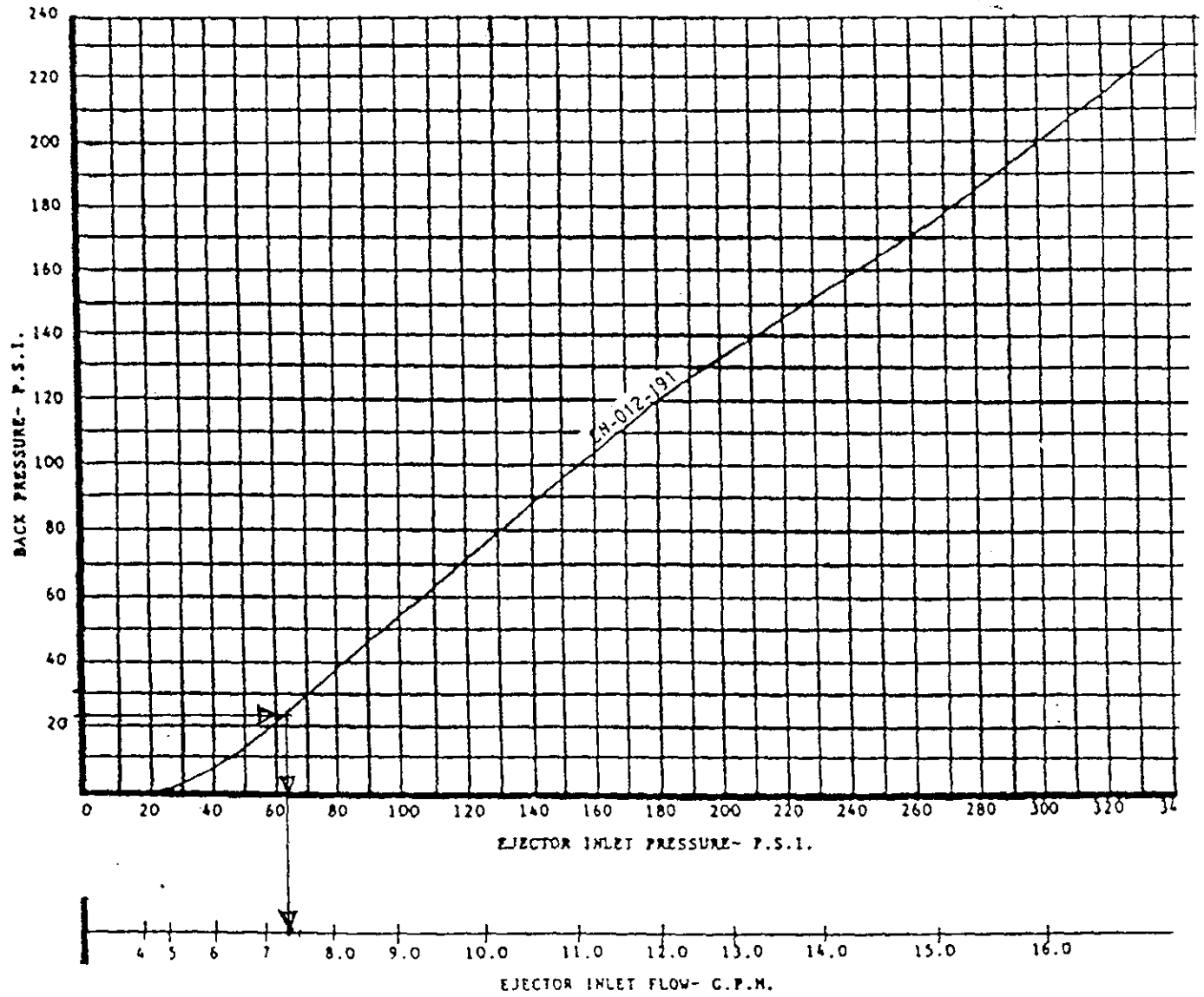
GRUNDFOS : Model CR2-40

~~Star~~ consumption of Cl_2 gas.

Rate of consumption at max. average flow = 17.2 kg/day

If small cylinders are used,
wt. of each cylinder = 65 kg

Avg. No. of days for 01 cylinder = 3.8



NOZZLE SIZING CHART, 100 PPD



BILL OF MATERIAL

**SWEDISH TRADING CO., LTD. - WATER DIVISION
 NO 191, VIKING HOUSE, GALLE ROAD
 MT. LAVINIA, SRI LANKA**

(1) MODEL 2175C automatic switchover chlorinator system 2 kg/hr. capacity, including
 (2) wall mounted vacuum regulators, (1) automatic switchover module (2) remote meter
 panels and (2) ejector assemblies. \$3,175 FOB factory /

(2) SINGLE CONNECTION MANIFOLDS, MA-121 with flex connector, heater and
 mounting bracket PRICE \$ 235 ea. TOTAL \$470. NET FOB factory

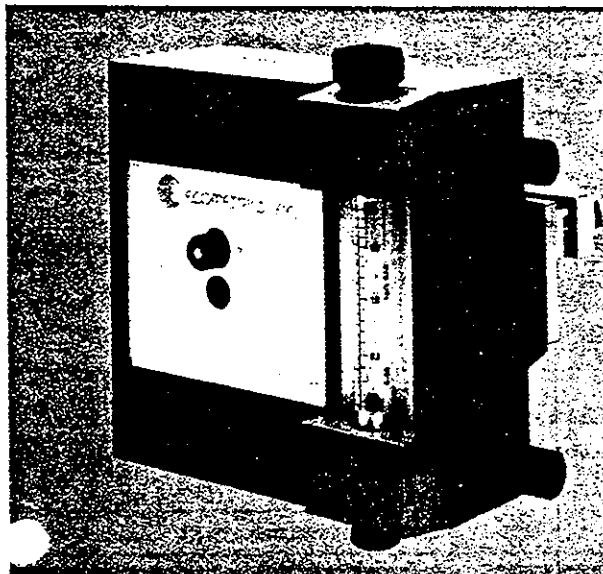
(2) SENSIOR GAS DETECTORS each with sensor audible and visual alarms
 PRICE \$ 795. EA. TOTAL \$1,590. NET

(3) SELF CONTAINED BREATHING APPARTUS with 30 minute cylinder, with
 facepiece, harness and carry case. PRICE \$1,590. EA. TOTAL \$4,770. NET FOB
 factory

(1) MODEL 2330 DUAL CYLINDER SCALE with two cylinder platform, readout
 module, and safety chains PRICE \$1,075 FOB factory

(1) LOT OF SPARE PARTS including: \$500 FOB factory
 (2) KT-100-VRC
 (1) KT-100-50M
 (2) KT-100-RMP
 (2) KT-100-EJS

3645



Designed for feeding chlorine, sulphur dioxide, ammonia and carbon dioxide

State of the art all-vacuum operation

Finest materials of construction

Cylinder, for container or manifold mounting—one simple connection

Wide ranges of feed rates—flowmeter capacities: 6 PPD (12g/h) up to 100 PPD (10kg/h)

APPLICATIONS

MUNICIPAL OR INDUSTRIAL-WATER TREATMENT

For disinfection of potable water in small or private treatment plants, chlorination of boiler make-up water and cooling water; slime and algae control in irrigation systems and swimming pools; disinfection of pool water.

MUNICIPAL OR INDUSTRIAL-WASTE TREATMENT

For small municipal wastewater plants, private plants, or for lift stations in large plants; treatment of metal-finishing wastes, wastes and other discharged water from the pulp and paper, food canning and freezing, brewing, bottling, and chemical-process plants.

INDUSTRIAL-PROCESS WATER

Taste and odor control in bottling plants and breweries; disinfection of process water and bleaching of raw materials in pulp and paper textile mills; high-purity water in the electronics and drug industries.

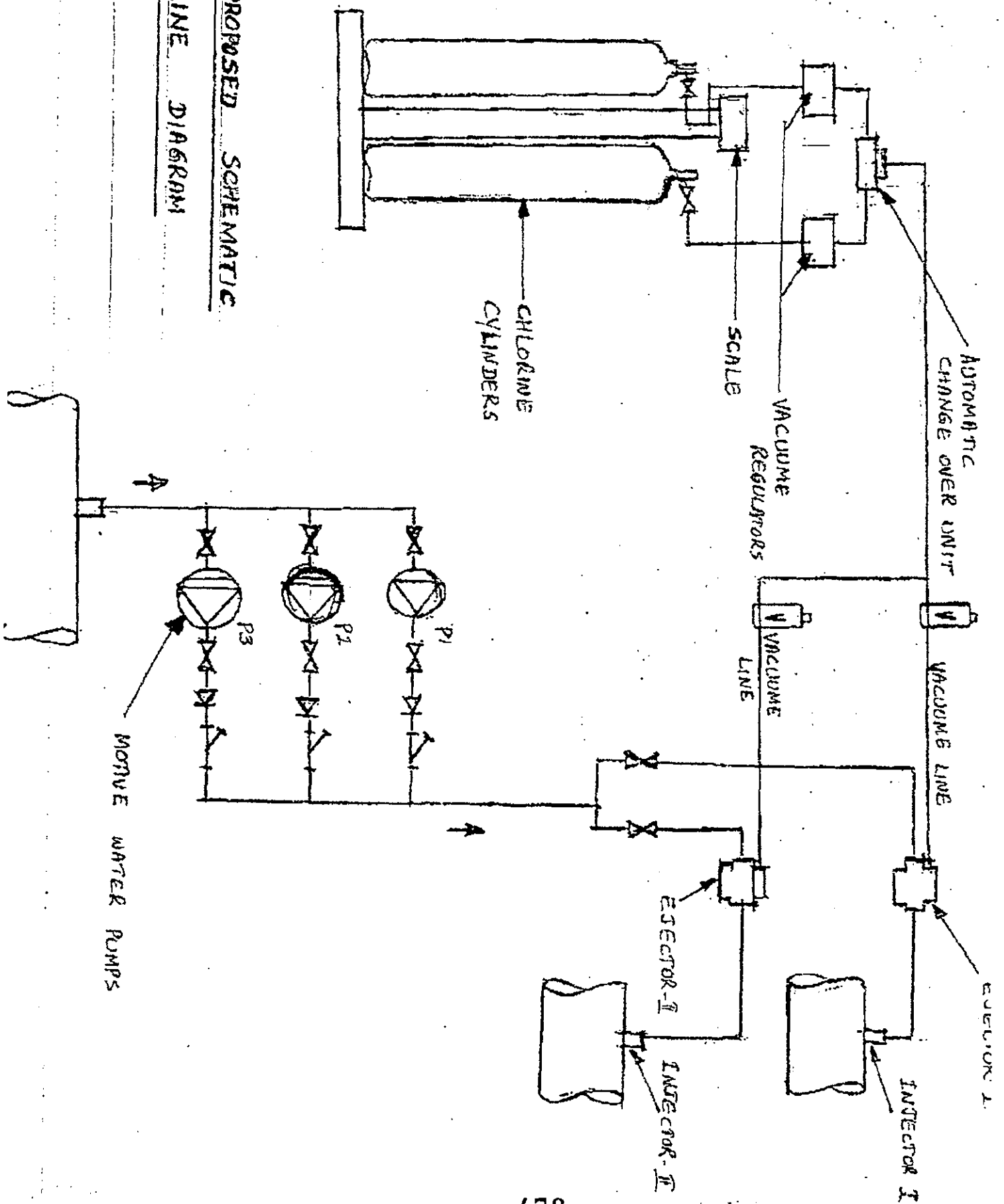
FEATURES

- **Safety**—All vacuum operation—there are no components carrying gas under pressure. A loss of vacuum causes the regulating valve to shut off the gas supply.

- **Economy**—There is no need for flexible connectors, piping and auxiliary valves.
- **Ease of Installation**—The vacuum regulator is easy to remove, clean and replace. A self-aligning yoke mounts the regulator directly on a gas cylinder or header valve.
- **Remote Ejector**—The ejector is designed for installation at the point of application. This eliminates the need for lengthy pressurized solution lines.
- **Remote Meter Capability**—The gas flowmeter may be remotely located from the vacuum regulator for operator convenience.
- **Vacuum Sealing Valve**—A built-in vacuum sealing valve closes when gas supply is shut-off or exhausted.
- **Automatic Switchover**—The gas feeder is available with automatic switchover. This time saving device helps to assure uninterrupted treatment and permits changing cylinders at operator convenience.
- **Automatic Control**—The gas feeder can easily be field up-graded for automatic flow-proportioning, residual or compound loop control.

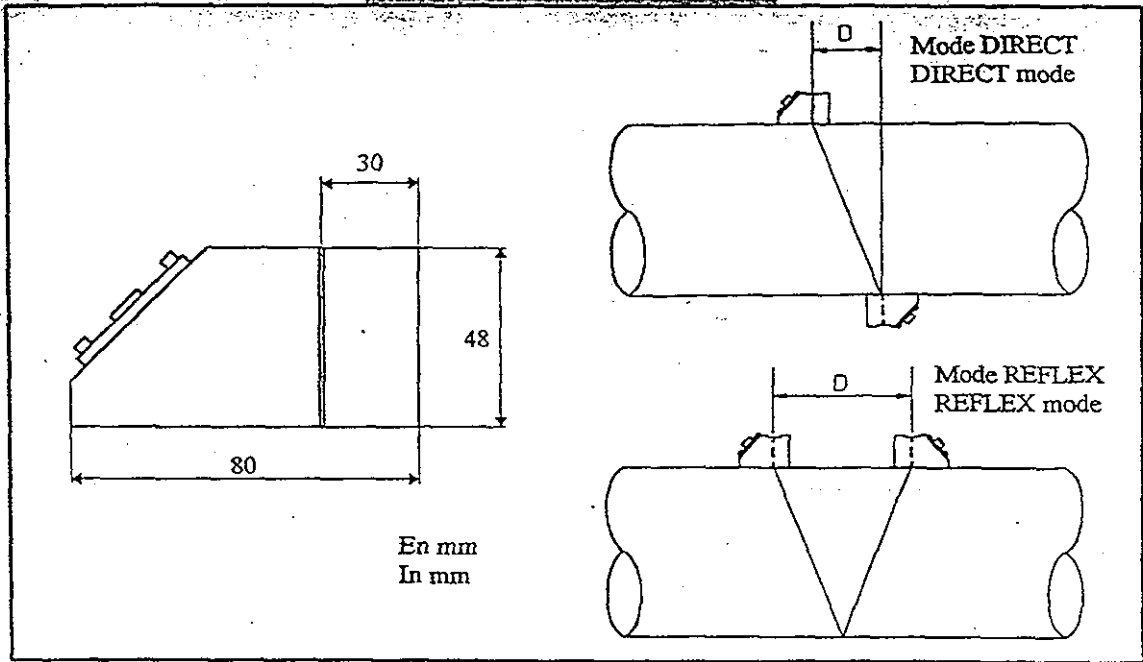
(Q) Ejector inlet flow = 7.4 gpm (us)

PROPOSED SCHEMATIC
LINE DIAGRAM



**MALIGAKANDA RESERVOIR SITE –
EXTERNAL CLAMP ON ULTRASONIC
FLOWMETER**

DN5000



DATAM
FLUTEC

Sonde externe pour débitmètre à ultrasons
External clamp-on probe for ultrasonic flowmeter

40

150

DN5000

Sonde externe pour débitmètre à ultrasons DFU-10P External clamp-on probe for DFU-10P ultrasonic flowmeter

Caractéristiques générales

- Sonde externe pour mesure de débit de liquides à travers l'épaisseur de la conduite.
- Ce type de sonde permet de s'affranchir de la pression et de l'agressivité du fluide.
- Utilisable pour les DN80 à DN5000
- Nature des conduites: Acier, acier inox, fonte et PVC.
- Température de fonctionnement:
 - DN5000 BT: de -10°C à 80°C.
 - DN5000 HT: de -10°C à 150°C
- Les sondes DN5000 peuvent fonctionner en montage reflex (recommandé pour les conduites de DN80 à DN1000) ou en montage direct.

Positionnement des sondes

- Pour conduites horizontales:
 - Les sondes doivent être placées de préférence à 45° par rapport aux axes horizontaux et verticaux.
 - Éviter absolument un montage sur l'axe vertical (possibilité de retenue d'air dans la partie supérieure et de dépôts dans la partie inférieure).
 - Pour conduites verticales:
 - Aucune restriction de montage
 - Longueurs droites minimales en amont: 15D à 40D selon le type d'obstacle perturbateur.
 - Longueurs droites minimales en aval: 4D.
 - La distance entre sondes, indiquée par le convertisseur DFU-10P après paramétrage, doit être prise entre les marques gravées sur les sondes.
 - Précision de positionnement:
 - Axial: $\pm 2\%$ de la distance
 - Angulaire: $\pm 2^\circ$
- La visualisation du niveau de réception des échos sur le barregraphe du convertisseur DFU-10P assiste l'utilisateur dans le positionnement optimal.

Installation des sondes

- Nettoyer l'emplacement des sondes pour supprimer les dépôts et la rouille éventuels,
- Appliquer un agent couplant entre les sondes et la conduite,
 - Gel de couplage standard pour les températures jusqu'à 80°C,
 - Graisse spéciale haute température pour les températures jusqu'à 150°C,
- Fixer fermement les sondes avec les sangles souples,
- Raccorder les sondes au convertisseur avec les 2 câbles de 10 m à montage rapide.

General characteristics

- External clamp-on probe for liquid flowmetering through the pipe material.
- This kind of probe is not affected by the pressure action and the fluid aggressivity.
- Suitable for ND80 to ND5000.
- Nature of pipe: Steel, stainless steel, cast iron and PVC.
- Operating temperature:
 - ND5000 BT: From -10°C to 80°C.
 - ND5000 HT: From -10°C to 150°C.
- The Probes can be either operate in reflex mounting (recommended for pipes from ND80 to DN1000) either in direct mounting.

Probe location

- For an horizontal pipe:
 - The probes must be installed, in preference to 45° in relation with the horizontal and vertical axis.
 - Avoid absolutely a mounting on the vertical axis (possibility of air bubbles and sediments deposit on the lower part).
- For a vertical pipe:
 - Any restriction for the mounting.
- Minimum upstream straight lenght: from 15D to 40D according to perturbing element type.
- Minimum downstream straight lenght: 4D
- The distance between probes, displayed by the DFU-10P converter after programming, must be taken from the engraved marks on the probes.
- Location accuracy:
 - Axial: $\pm 2\%$ of the distance
 - Angular: $\pm 2^\circ$

The visualization of the received echo level on the DFU-10P converter baregraph, helps the user in an optimal probes positionning.

Probes installation

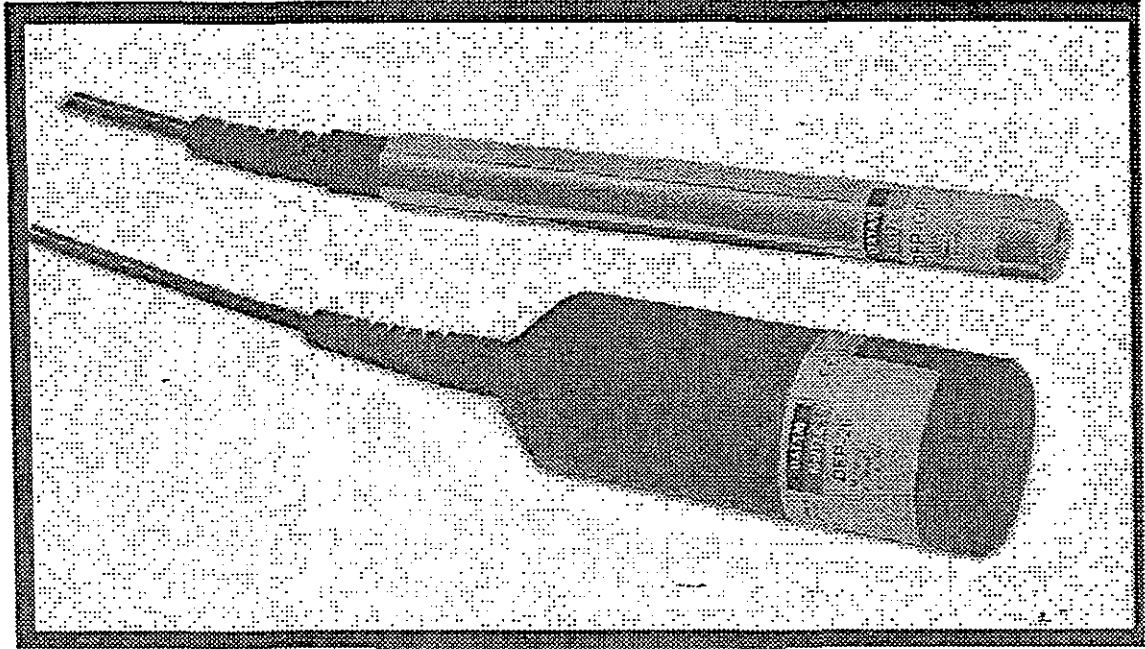
- Clean up the duct, prior to start the probes positionning. In most of the case the paint does not mind.
- Apply plenty of coupling agent (gel or grease) between the probe and the pipe wall,
 - Standard couplig fluid (gel) for temperature up to 80°C,
 - Special high temperature couplig grease for temperature up to 150°C,
- Firmly strap up the probes with supplied clamps belts.
- Connect the probes to the converter with the 2 supplied cables.



dn5000.doc du 01.10.1997

4 rue Henri Poincaré - 92167 Antony Cedex France
Téléphone: (33).01.46.11.66.00 - Télécopie : (33).01.46.11.66.11

DFP-GP



DATAM

FLUTEC

Capteurs de niveau piézorésistifs immergés
Piezoresistive water depth transducers
Captadores de nivel piezoresistivos sumergidos

DFP-20 & DFP-GP

Piezoresistive water depth transducers

Main Features

Based on a ceramic primary element, technology TRANSBAR®, the transducers DFP-20 and DFP-GP are the measuring sensors dedicated to the level measurement of liquids.

- Technology TRANSBAR®.
- Output current 4-20 mA (2 wires).
- Zero and full scale adjustment at factory.
- Power supply from 10 to 36Vdc.
- Protection against reverse polarity and transient voltages.
- Measuring range from 0-5 mWG to 0-160 mWG.
- Protection IP68.
- Excellent long term stability.
- Stainless Steel body and PVC lid.

Principle

The hydrostatic pressure deform a diaphragm in ceramic on which about is spreaded a strain gauge bridge at thick film. The unbalance bridge voltage, resulting of the diaphragm deformation due to the effect of the pressure, is amplified, corrected and adapted in a 4-20 mA signal by a converter built in the sensor.

Presentation

The Transducers DFP-20 and DFP-GP are designed as following:

- One 316L stainless steel envelope including the measuring cell, the integrated converter and the protection against the transient and over voltages,
- One self-supporting cable at 2 wires with a capillary tube for the reference with the atmosphere,
- One quick clamping hooking device.

Applications

The Transducers DFP-20 and DFP-GP are installed by simple suspension into the reservoirs, tanks, wells, water reaches, sewers or open channels.

They can be used alone, or associated with some equipments as:

- Measure Converter DFC-MI allowing the full range adjustment of a sensor used at its nominal measuring range, the 24Vdc power supply for the transducer and the thresholds monitoring,
- Transmission point to point DFT-120,
- Local RTU's DFT-25, DFT-80, F2.

Characteristics at 20°C

Measuring range of the DFP-20:

Nominal Pressure (mWG)	Maximum Pressure (mWG)	Bursting Pressure (mWG)
0-5	12,5	25
0-10	12,5	25
0-20	25	50

Measuring range of the DFP-GP:

Nominal Pressure (mWG)	Maximum Pressure (mWG)	Bursting Pressure (mWG)
0-20	30	120
0-40	60	120
0-60	90	180
0-100	150	300
0-160	240	480

- Power supply: 10 to 36 Vdc.
- Output signal: 4-20 mA (2 wires).
- Load resistance $\Omega = \frac{Vdc - 10}{0.020}$
- Accuracy: $\pm 0.3\%$ of the Full Scale.
- Zero and full scale adjustment:
Zero adjustment: $\pm 5\%$ of the Full Range.
Range adjustment: from 1/1 to 1/2 of the Full Range.
- Operating and storage temperature: from -10°C to 85°C.
- Zero drift function of the temperature:
Max: $\pm 0.025\%$ of the F.S./°C.
- Thermic variation of the sensibility:
Max: $\pm 0.015\%$ of the F.S./°C.
- Materials in contact with the fluid:
DFP-20: Alumine Al_2O_3 , S.S. 316L, PVC, Nitrile.
DFP-GP: Alumine Al_2O_3 , S.S. 316L, Nitrile.
Cable: Elastomer of polyurethane.
- Connection:
DFP-20: Cable length equal to the nominal range added of 5 meters.
DFP-GP: Cable length on request.
- Dimensions DFP-20: $\varnothing 64 \times 185$ mm.
- Dimensions DFP-GP: $\varnothing 26 \times 290$ mm.
- Weight DFP-20: 900g + 120g per meter of cable.
- Weight DFP-GP: 400g + 120g per meter of cable.

Electrical connection

1	+ Vdc	Red
2	- Vdc	Blue
\perp	Ground	Screen

DATAM
TELETEC

Dfp20gpa.doc du 20.10.1997

4 rue Henri Poincaré - 92167 Antony Cedex France
Téléphone (33).01.46.11.66.00 - Télécopie : (33).01.46.11.66.11

**ELLIE HOUSE RESERVOIR –
PENSTOCK GATES**

PENSTOCKS

SELECTION

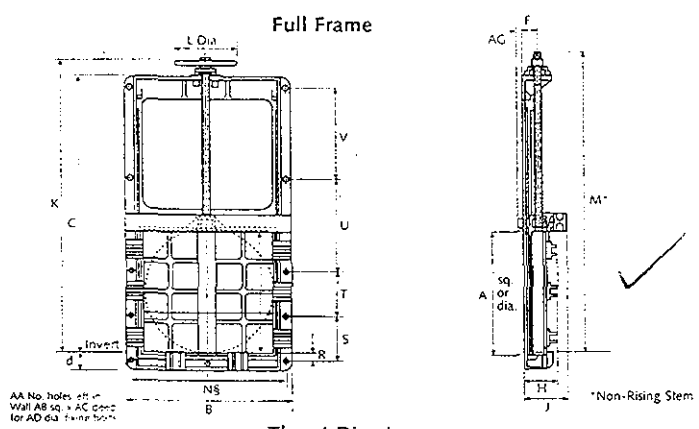
HAM BAKER™ SERIES 160-80

PHYSICAL DETAILS

Size range 150 to 1500 mm sq. or dia.
(Refer to both tables)

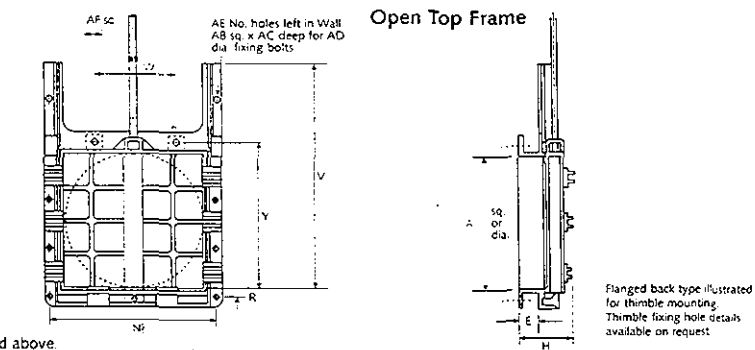
‡ On sizes 1300 mm and above, manual gearboxes or power operated actuators are normally supplied

Dimensions cover Series 160-80 only. Details for Series 250-130 and 300-150 are on request.



Thrust Direct

A	B	C	D	d	E	F	H	J	K	L	M
DIMENSIONS IN MILLIMETRES											
150	320	415	225	90	75	70	110	-	510	250	635
200	370	515	300	90	75	70	110	-	595	250	735
250	420	615	375	90	75	70	110	-	710	250	835
300	470	715	450	90	75	70	110	210	810	250	935
350	580	825	525	115	100	70	150	235	920	300	1045
400	630	925	600	115	100	70	160	235	1020	300	1145
450	680	1025	675	115	100	70	160	235	1120	300	1245
500	730	1145	750	115	100	90	195	290	1240	400	1365
600	830	1340	900	115	125	90	195	290	1440	400	1565
700	1020	1700	1050	160	125	135	265	395	1830	400	1935
750	1070	1800	1125	160	125	135	270	395	1930	400	2035
800	1120	1900	1200	160	125	135	270	395	2030	400	2135
900	1220	2100	1350	160	125	135	270	395	2230	500	2335
1000	1320	2300	1500	160	125	135	275	400	2430	500	2535
1100	1420	2500	1650	160	125	135	280	510	2630	500	2735
1200	1520	2700	1800	160	125	135	280	490	2830	500	2935
1300	1620	2900	1950	160	125	135	285	480	‡	500	‡
1400	1720	3100	2100	160	125	135	290	550	‡	500	‡
1500	1820	3300	2250	160	125	135	310	600	‡	500	‡



Thrust Remote - Rising Stem

§ Central fixing hole on sizes 1100 mm and above.

A	N	R	S	T	U	V	W	Y	AA	AB	AC	AD	AE	AF	AG
DIMENSIONS IN MILLIMETRES															
150	280	45	275	160	-	-	-	-	6	45	100	M12	4	-	65
200	330	45	300	235	-	-	-	-	6	45	100	M12	4	-	65
250	380	45	375	260	-	-	-	-	6	60	125	M16	4	-	65
300	430	45	425	310	-	-	-	-	6	60	125	M16	4	-	65
350	510	65	240	320	280	-	-	-	8	60	125	M16	6	-	65
400	560	65	265	345	330	-	-	-	8	60	125	M16	6	-	65
450	610	65	290	365	385	-	-	-	8	60	125	M16	6	-	65
500	660	65	315	400	425	-	-	-	8	60	125	M16	6	-	65
600	760	65	365	450	525	-	-	-	8	60	125	M16	6	-	65
700	940	80	425	625	625	-	-	-	8	75	200	M24	6	-	65
750	990	80	450	650	650	-	-	-	8	75	200	M24	6	-	65
800	1040	80	480	700	700	-	-	-	8	75	200	M24	6	-	65
900	1140	80	700	600	600	-	-	-	8	75	200	M24	6	-	65
1000	1240§	80	750	750	750	-	-	-	8	75	200	M24	6	-	65
1100	1340§	80	810	810	810	-	600	1225	11	75	200	M24	9	190 sq.	65
1200	1440§	100	900	900	900	-	600	1325	11	75	200	M24	9	190 sq.	65
1300	1540§	100	400	650	900	900	650	1450	13	75	200	M24	11	190 sq.	65
1400	1640§	100	700	500	900	900	650	1550	13	75	200	M24	11	190 sq.	65
1500	1740§	100	700	600	900	900	750	1650	13	75	200	M24	11	190 sq.	65

**GOTHATUWA – KOLONNAWA PUMP HOUSE -
PUMPS**

LH222

Technical Schedule: Item 1

Customer Name: GESCO
 Your Ref No: 08 November
 Application: Transfer Duties

Project Name:
 Our Ref No:

Ambathale Pump house
~~Kotikawatta-Gotkatrawa~~
 EU00362

Conditions of Service

Duty Flowrate:	<u>840 m³/hr</u>	Generated Head:	<u>50 m</u>
Pump Efficiency:	89.8 %	Fluid Type:	Cold Clean Water
Pump Speed:	1487 R.P.M.	Specific Gravity:	1.0
Absorbed Power:	127.5kW	Viscosity:	1.0 cpoise
N.P.S.H.R.:	5.56m	Temp. Range:	5 - 25 Deg C

Pump Construction

Pump Type:	Uniglide	Suction Dia:	300 mm
Framesize:	SDB 250/300 B	Discharge Dia:	250 mm
No. Off:	3	Flange Drilling:	BS4504 PN16
Pumpset Argmnt:	Horizontal	Sealing Argmnt:	Packed Gland
No. of Stages:	One	Seal Flush Argmnt:	Recirculating
Rotation on NDE:	AntiClockwise	Bearing Details:	Standard Bearings

Driver Ratings

Motor Type:	Squirrel Cage	Power Rating:	160kW
Motor Framesize:	315S	Insulation Class:	Class F
Enclosure:	TEFC IP55 Standard cast iron	Temperature Rise:	Class B
Motor Poles:	4 pole	A.C.Heaters:	None
Electricity Supply:	400/3/ 50 Hertz	Thermistors:	None

Materials

Pump Casing:	Cast Iron BS 1452 GR 250	Casing Wear Ring :	Bronze BS 1400 LG4
Internal Coating:	Efficiency Enhancement (PAI 5004)	Impeller Wear Rings:	Bronze BS 1400 LG4
Shaft:	Carbon Steel BS 970 080M40	Coupling:	Flexible Coupling
Impeller:	Bronze BS 1400 LG4	Coupling Guard:	Mild Steel
Shaft Sleeves:	Bronze BS 1400 LG4	Support:	None

Testing

Performance:	None	Witness Perf.:	None
N.P.S.H.:	None	Witness N.P.S.H.:	None
Variable Speed:	None	Witness V.S.:	None
Vibration:	None	Witness Vib.:	None
Noise:	None	Witness Noise:	None

Technical Comments

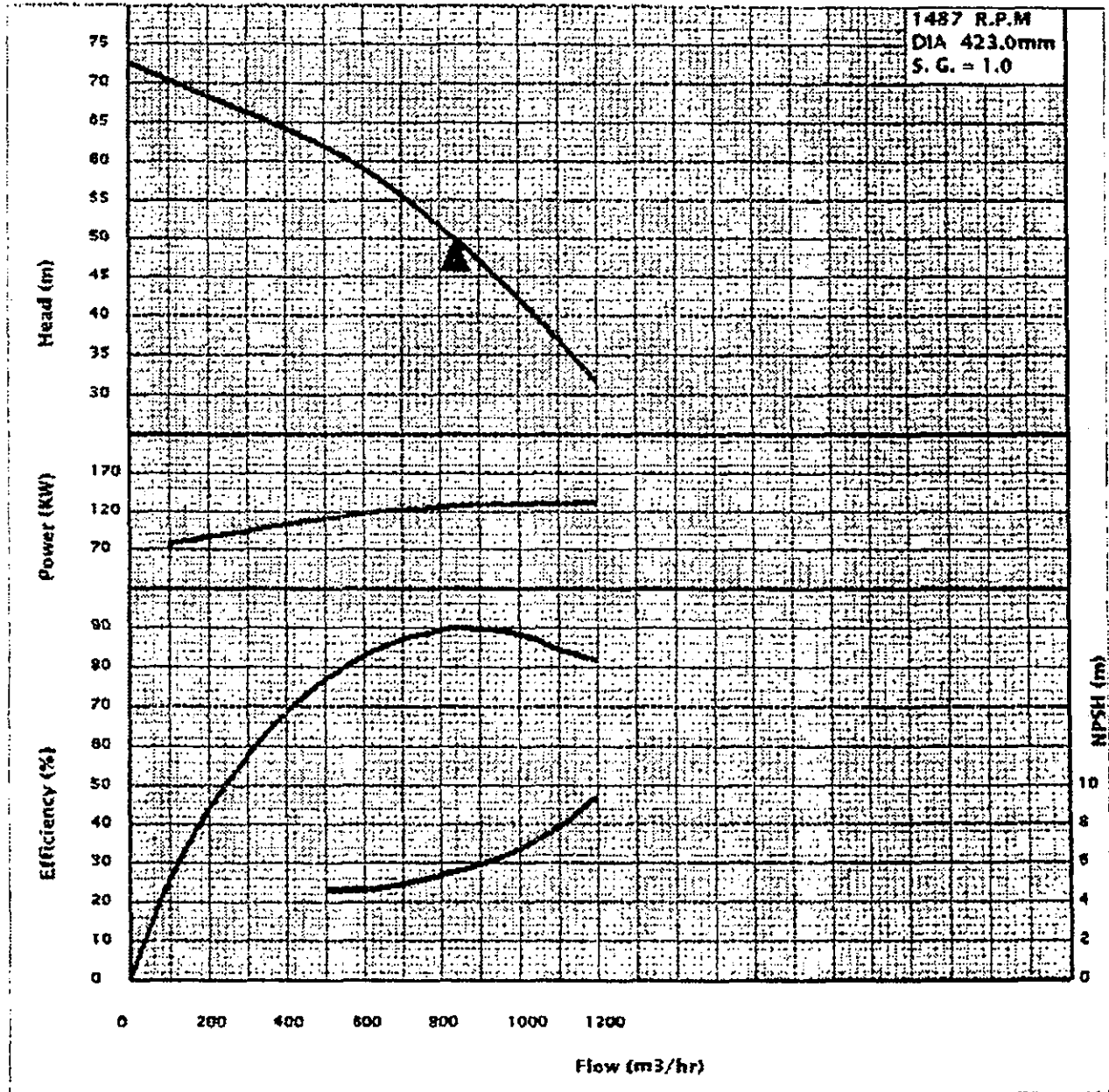
WPL Tender Ref: EU00362

LEHR

Performance Curve Item 1

Horizontal Uniglide Pumpset

Pump Framesize: SDB 250/300 B, Motor Framesize: 315S



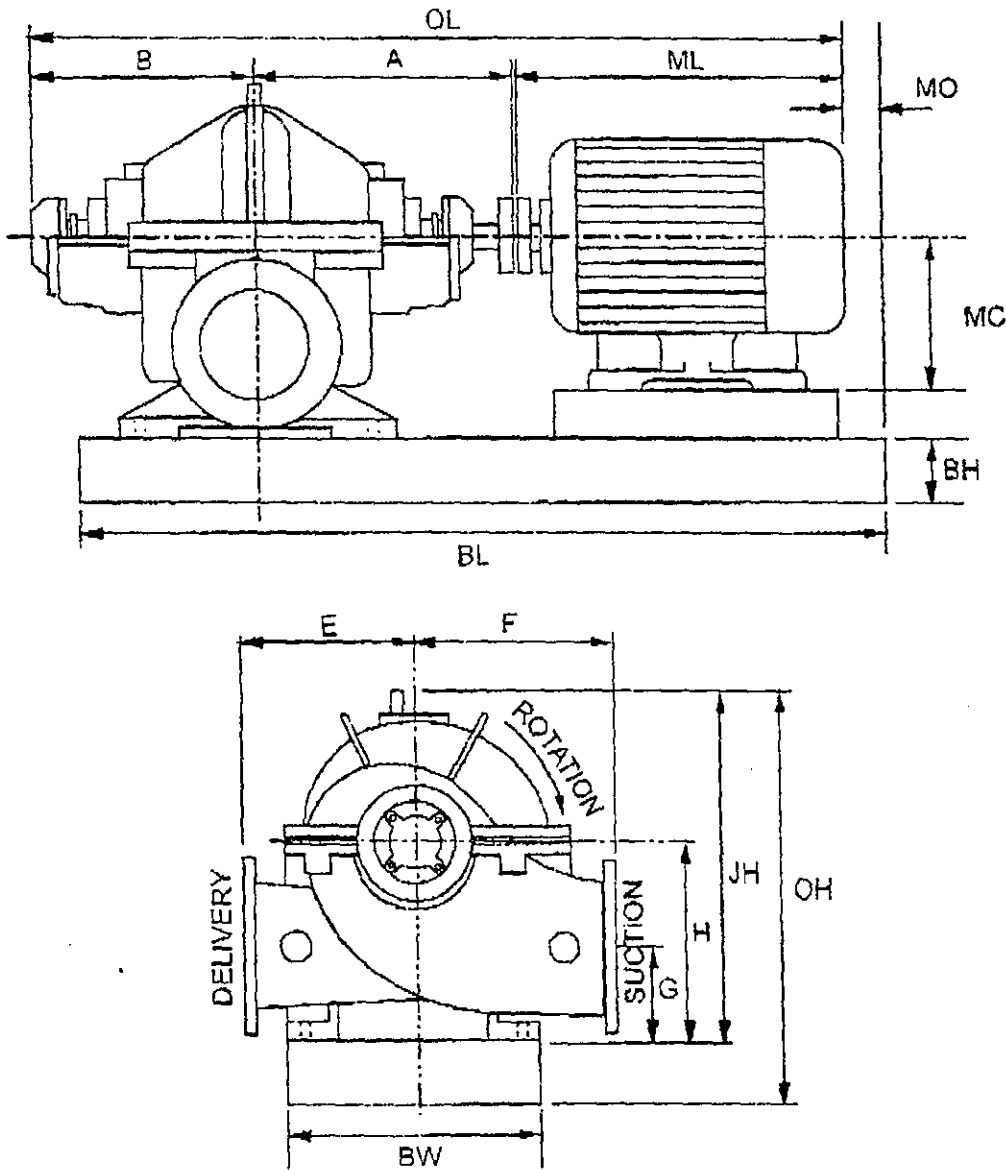
This is a preliminary Curve and all information given is for Tender Purposes Only. This curve is based on Sample Tests with Water.

WWR

General Arrangement Sketch: Item 1

Horizontal Uniglide Pumpset

Pump Framesize: SDB 250/300 B, Motor Framesize: 315S



A	B	E	F	G	H	J	ML	MC	MO	BL	BH	BW	OL	OH	Tot Weight
582	450	470	470	195	500	927	1158	315	-255	1850	155	740	2173	1082	2073

This is a preliminary drawing and all information given is for tender use only.
 Sizes given are in mm, weights are in kg, unless otherwise stated.
 Not to scale.

WPL Tender Ref: EU00362

WPL

Product Description: Item 1

Introduction

The Uniglide is a single stage, split casing centrifugal pump. The axially split casing allows removal of the complete rotating element without disturbing the pipework or motor. Rotation is anti-clockwise when looking at the non-drive end of the pump.

Pump Arrangement

Depending upon the pump and motor combination, the pumpset is supported on a solid baseplate of either folded or fabricated design in steel. All baseplates are of rigid construction, minimising vibration.

Casing

The pump casing is axially split and ribbed for high strength and rigidity. Suction and delivery branches are cast integrally with the bottom half casing and flanges are drilled to suit individual requirements. Casing wear rings and stuffing box bushes are fitted for ease of replacement and preservation of running clearances, to maintain optimum efficiency. A joint is fitted between the two half casings to ensure a watertight seal. An air release valve is fitted at the highest point of the pump casing.

Impeller

The impeller is of double entry suction type, giving maximum suction performance and ensuring hydraulic balance. It is machined to closely maintained tolerances with the impeller vanes hand dressed to give a high quality surface finish in the water passages, and is balanced prior to assembly. A keyway extends the full length of the impeller hubs to provide a positive drive, and provision is made on the impeller necks for fitting renewable wear rings as required.

Shaft

The shaft is manufactured in high grade materials to suit all imposed stresses, and has a critical speed at least 20% above the maximum operating speed. Keyways are provided for the impeller and coupling. Renewable sleeves driven by an extension of the impeller key extend through the stuffing boxes to protect the shaft. Water throwers are fitted to prevent water ingress to the bearings. The complete shaft assembly is held together by positively locked nuts located at each end of the shaft.

Bearings

The bearing housings are carried in rigidly constructed brackets cast integrally with the bottom half casing and are doweled to provide positive location, maintaining pump alignment. The standard horizontal bearing arrangement comprises a roller bearing at the drive end of the pump, and a ball bearing at the non-drive end. The bearings are grease lubricated.

Sealing

Pumps are supplied with conventional packed glands using pre-lubricated cotton packing. The

ශ්‍රී ලංකා ප්‍රජාතාන්ත්‍රික සමාජවාදී ජනරජයේ ගැසට් පත්‍රය

අති විශේෂ

The Gazette of the Democratic Socialist Republic of Sri Lanka

EXTRAORDINARY

අංක 1,129/14 — 2000 අප්‍රේල් 28 වැනි සිකුරාදා — 2000.04.28
No. 1,129/14 — FRIDAY, APRIL 28, 2000

(Published by Authority)

PART I : SECTION (I) — GENERAL

Government Notifications

CEYLON ELECTRICITY BOARD

Tariffs and Charges

NOTICE is hereby given in terms of Section 52 (2) of the Ceylon Electricity Board Act, No. 17 of 1969 that it is intended to introduce with effect from 01st June, 2000, the following tariffs and charges for the supply of electrical energy to all direct consumers of the Ceylon Electricity Board who are supplied by the integrated hydro-thermal electrical power system.

ARJUN DERANIYAGALA,
Chairman.

Ceylon Electricity Board,
Sir Chittampalam A. Gardiner Mawatha,
Colombo 02,
28th April, 2000.

SECTION I—DOMESTIC TARIFF

Rate D-1.

(a) This rate applies to supply of electricity used for Domestic purposes in private residences.

(b) The charges in each 30 day billing period for supply under this tariff will be as follows :—

- (i) For the 1st 30 units (1 block) at a basic rate of Rs. 2.40 per-unit; and
- (ii) For the units in excess of 30 units up to 90 units (2nd block) at a basic rate of Rs. 2.90 and
- (iii) For the units in excess of 90 units up to 180 units (3rd block) at a basic rate of Rs. 5.50 and

(iv) For units in excess of 180 units (4th block) at a rate of Rs. 7.20

(c) A minimum charge of Rs. 30.00 per billing period will apply

Rate G.P.-1.

- (a) This rate shall apply to supplies at each individual point of supply delivered and metered at 400/230 Volts nominal and where the contract demand is less than 42kVA.
- (b) The charges in each billing period under this tariff shall be the sum of charges (i) and (ii) given below :—
- A basic rate of Rs. 6.80 per unit.
 - A fixed charge of Rs. 30.00 per billing period if contract demand is 10kVA and below and a fixed charge of Rs. 230.00 if the contract demand is above 10kVA but less than 42kVA.

Rate G.P.-2

- (a) This rate shall apply to supplies at each individual point of supply delivered and metered at 400/230 Volts nominal and where the contract demand is equal to or exceeds 42kVA.
- (b) The charges in each billing period for supplies under this tariff shall be the sum of charges (i), (ii) and (iii) given below :—
- A maximum demand charge at the rate of Rs. 350.00 per kVA of the maximum demand made during the billing period ;
 - A unit charge at the basic rate of Rs. 6.40 per unit ;
 - A fixed charge of Rs. 550.00 per billing period.

Rate G.P.-3

- (a) This rate shall apply to supplies at each individual point of supply delivered and metered at 11,000 Volts nominal and above.
- (b) The charges in each billing period for supplies under this tariff shall be the sum of charges (i), (ii) and (iii) given below :—
- A maximum demand charge at the rate of Rs. 330.00 per kVA of the maximum demand made during the billing period ;
 - A unit charge at the basic rate of Rs. 6.30 per unit ;
 - A fixed charge of Rs. 550.00 per billing period.

SECTION 5— INDUSTRIAL TARIFF

This rate I.1, I.2 and I.3 set out below shall be applicable to a supply of electricity used wholly or mainly for motive power or for electro-chemical process in factories, workshops, foundaries, oil mills, spinning and weaving mills, water supply and irrigation pumping stations, port and dock installations and hotels but shall not be applicable to a supply of electricity covered under Section 6 of this Schedule.

Rate I-1

- (a) This rate shall apply to supplies at each individual point of supply delivered and metered at 400/230 Volts nominal and where the contract demand is less than 42kVA.
- (b) The charges in each billing period for supplies under this tariff shall be the sum of charges (i), (ii) given below :—
- A unit charge at the basic rate of Rs. 4.75 per unit ;
 - A fixed charge of Rs. 30.00 per billing period if the contract demand is 10kVA or below and a fixed charge of Rs. 230.00 if the contract demand is above 10kVA but less than 42kVA.

SECTION 2— TARIFF APPLICABLE TO RELIGIOUS PREMISES AND CHARITABLE INSTITUTIONS

Rate R-1.

- (a) This rate shall apply to supplies of electricity to—
- (i) Places of public religious worship including private residences of priests where such residences are associated with or are within the curtilage of a place of public religious worship ; and
 - (ii) Homes for Aged, Orphanages, and Homes for the Handicapped, which are specifically certified by the Director of Social Services as Charitable Institutions, and approved by the Ceylon Electricity Board.
- (b) The installation should not include any building used mainly or wholly for commercial purposes.
- (c) The charges in each 30-day billing period under this tariff will be as follows :—
- (i) For the 1st 30 units (1 block) at a basic rate of Rs. 2.00 per unit ;
 - (ii) For the units in excess of 30 units up to 90 units (2nd block) at a basic rate of Rs. 2.10 and
 - (iii) For the units in excess of 90 units up to 180 units (3rd block) at a basic rate of Rs. 3.20 and
 - (iv) For units in excess of 180 units (4th block) at a basic rate of Rs. 5.75 per unit.
- (c) A minimum charge of Rs. 30.00 per billing period will apply.

SECTION 3— TARIFF APPLICABLE FOR BULK SALES TO
LANKA ELECTRICITY COMPANY (PVT) LIMITED

The rates L-1 and L-2 set out below shall apply to bulk supplies provided to Lanka Electricity Co. (Pvt) Limited.

Rate L-1.

- (a) This rate shall apply to supplies delivered and metered at 400/230 Volts nominal. The charges in each billing period under this tariff shall be the sum of the charges (i) and (ii) given below :—
- (i) A maximum demand charge at the rate of Rs. 150.00 per kVA of the maximum demand made during the billing period at each individual point of supply.
 - (ii) A basic rate of Rs. 3.20 per unit.

Rate L-2.

- (b) This rate shall apply to supplies delivered and metered at 11,000 Volts nominal and above. The charges in each billing period under this tariff shall be the sum of the charges (i) and (ii) given below :—
- (i) A maximum demand charge at the rate of Rs. 130.00 per kVA of the maximum demand made during the billing period at each individual point of supply.
 - (ii) A basic rate of Rs. 2.50 per unit.

SECTION 4— GENERAL PURPOSE TARIFF

The rates G.P.1, G.P.2, and G.P.3 set out below shall be applicable to a supply of electricity to be used in shops, offices, banks, warehouses, public buildings, hospitals, educational establishments, places of entertainment and other premises not covered under any other tariffs in this Schedule.



**GOTHATUWA – KOLONNAWA PUMP HOUSE
– SURGE TANKS**

Attn: Mr. Karunaratna

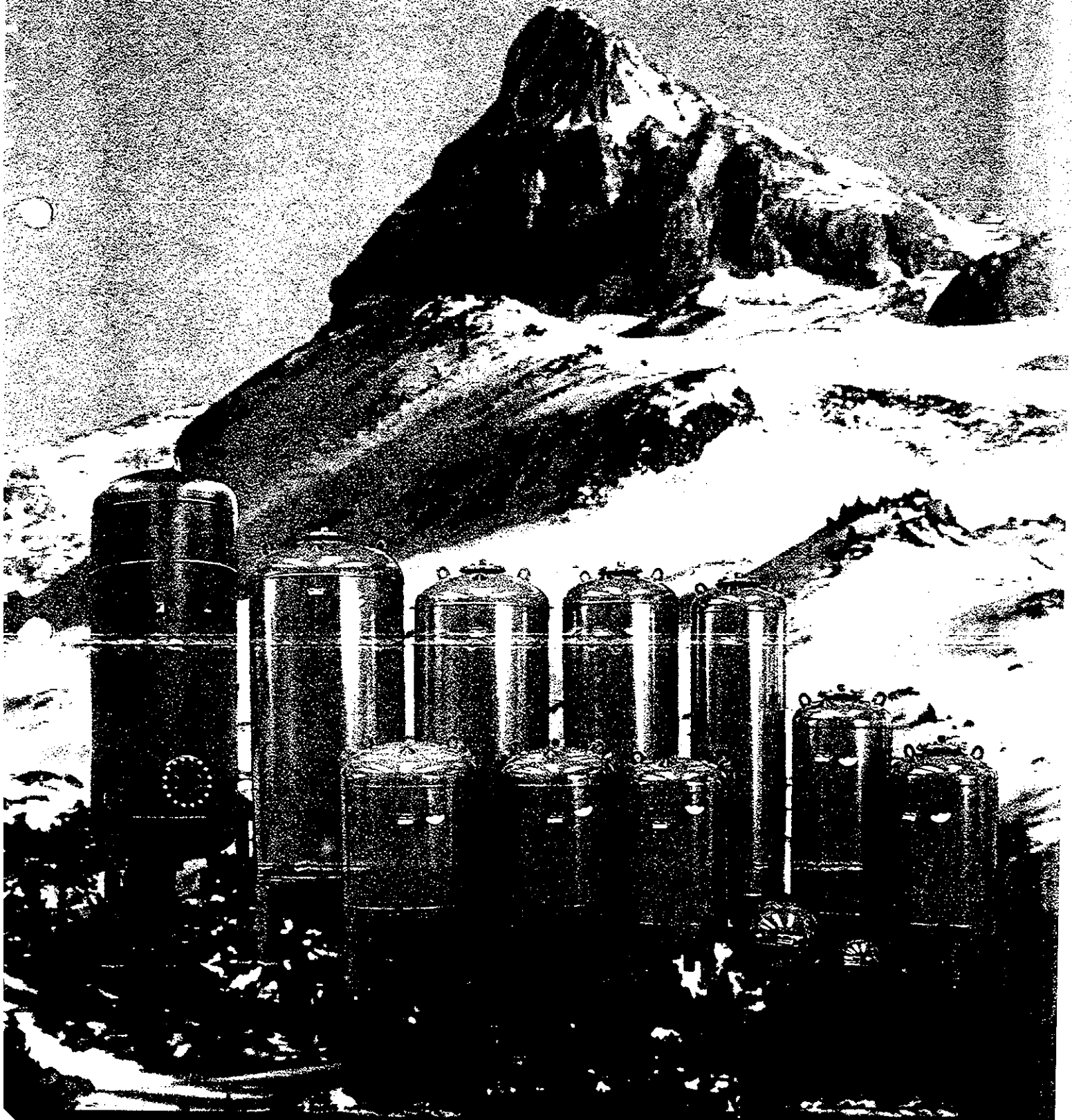


I. IBAÑONDO S.A.

075-330511



**VASO DE EXPANSION CON MEMBRANA RECAMBIABLE
REPLACEABLE BLADDER EXPANSION TANK
VASE D'EXPANSION A VESSIE**

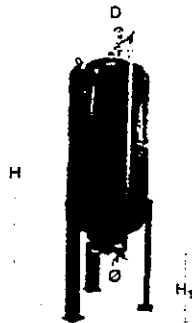


REGISTRADO POR LA DIRECCION DE ADMINISTRACION DE INDUSTRIA, ENERGIA Y MINAS
REGISTERED BY THE INDUSTRY, ENERGY AND MINERY ADMINISTRATION MANAGEMENT
ENREGISTRÉ PAR LA DIRECTION D'ADMINISTRATION D'INDUSTRIE, ENERGIE ET DES MINES

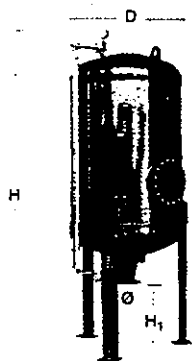
PRESIONES DE SERVICIO - PRESSUR SERVICE - PRESSION DE SERVICE 6-10-15-20-25-30-35-40 Bar

CARACTERISTICAS TECNICAS Y DIMENSIONES - TECHNICAL SPECIFICATIONS AND DIMENSIONS - ESPECIFICATIONS TECHNIQUES ET DIMENSIONS

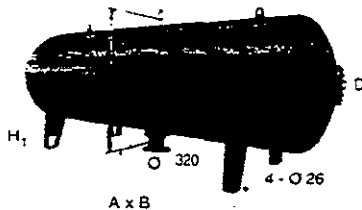
TIPOS 1.000 Y 1.400 CON NIVEL
TYPES 1,000 & 1,400 WITH LEVEL
TYPES 1000 ET 1400 À NIVEAU



Código Code	Tipo Type	Capacidad Capacity Capacité Ls.	Presión máx. Trabajo Maximum working Pressure Pression max. Travail Bar	Dimensiones aproximadas Approx. dimensions Cotes d'encombrement			Conexión de agua Water connection Conexion d'eau Ø DN
				D mm	H mm	H ₁ mm	
07100201	100 AHN-P	100	6-40	320	2.160	400	DN-100
07200201	200 AHN-P	200	6-40	400	2.340	400	DN-100
07350201	350 AHN-P	350	6-40	500	2.530	400	DN-100
07500201	500 AHN-P	500	6-40	600	2.530	400	DN-100
07750201	750 AHN-P	750	6-40	700	3.070	650	DN-150
07910201	1.000 AHN-P	1.000	6-40	850	3.120	650	DN-150
07914201	1.400 AHN-P	1.400	6-40	1.000	3.060	650	DN-150



Código Code	Tipo Type	Capacidad Capacity Capacité Ls.	Presión máx. Trabajo Maximum working Pressure Pression max. Travail Bar	Dimensiones aproximadas Approx. dimensions Cotes d'encombrement			Conexión de agua Water connection Conexion d'eau Ø DN
				D mm	H mm	H ₁ mm	
07920201	2.000 AHN-P	2.000	6-40	1.200	3.500	700	250-350-500
07930201	3.000 AHN-P	3.000	6-40	1.200	4.500	700	250-350-500
07950201	5.000 AHN-P	5.000	6-40	1.500	4.715	700	250-350-500
07960201	6.000 AHN-P	6.000	6-40	1.500	5.345	700	250-350-500
07980201	8.000 AHN-P	8.000	6-40	1.600	5.995	700	250-350-500
07991201	10.000 AHN-P	10.000	6-40	1.600	7.090	700	250-350-500
07912520	12.500 AHN-P	12.500	6-40	1.800	7.090	700	250-350-500
07915020	15.000 AHN-P	15.000	6-40	2.000	6.845	700	250-350-500



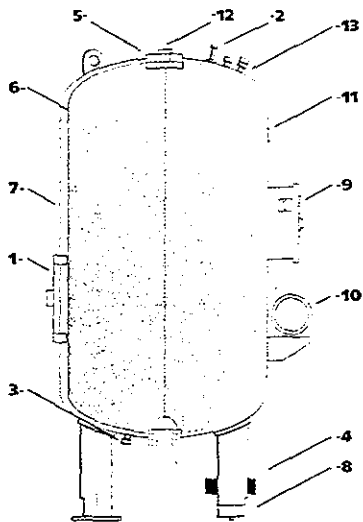
Código Code	Tipo Type	Capacidad Capacity Capacité Ls.	Presión máx. Trabajo Maximum working Pressure Pression max. Travail Bar	Dimensiones aproximadas Approx. dimensions Cotes d'encombrement				Conexión de agua Water connection Conexion d'eau Ø DN
				D mm	L mm	H ₁ mm	A x B	
07920202	2.000 AHN-H	2.000	6-40	1.200	2.300	400	1.000 x 900	250-350-500
07930202	3.000 AHN-H	3.000	6-40	1.200	3.300	400	1.600 x 900	250-350-500
07950202	5.000 AHN-H	5.000	6-40	1.500	3.515	400	1.800 x 1.200	250-350-500
07960202	6.000 AHN-H	6.000	6-40	1.500	4.145	400	2.000 x 1.200	250-350-500
07980202	8.000 AHN-H	8.000	6-40	1.600	4.795	400	2.500 x 1.300	250-350-500
07991202	10.000 AHN-H	10.000	6-40	1.600	5.890	400	3.500 x 1.300	250-350-500
07912522	12.500 AHN-H	12.500	6-40	1.800	5.890	400	3.500 x 1.500	250-350-500
07915012	15.000 AHN-H	15.000	6-40	2.000	5.650	400	3.500 x 1.700	250-350-700
07918022	18.000 AHN-H	18.000	6-40	2.200	5.500	500	3.000 x 1.800	250-350-700
07920022	20.000 AHN-H	20.000	6-40	2.200	6.100	500	3.500 x 1.800	250-350-700
07922022	22.500 AHN-H	22.500	6-40	2.200	6.730	500	3.500 x 1.800	250-350-700
07925022	25.000 AHN-H	25.000	6-40	2.300	6.850	500	4.000 x 1.900	250-350-700
07927022	27.500 AHN-H	27.500	6-40	2.300	7.500	500	4.000 x 1.900	250-350-700
07930022	30.000 AHN-H	30.000	6-40	2.500	7.000	600	4.000 x 1.700	250-350-700
07932022	32.500 AHN-H	32.500	6-40	2.500	7.550	600	4.000 x 1.700	250-350-700
07935022	35.000 AHN-H	35.000	6-40	2.500	8.050	600	5.000 x 1.700	250-350-700

Nota: Para presiones superiores a 40 Bar y capacidad superior a 35.000 L. consultar en fabrica.
Note: For pressures upper to 40 Bar and capacities over 35.000 L. please ask factory for advise.
Note: Pour pressions supérieures a 40 Bar et capacités de plus de 35.000 L. veuillez consulter l'usine.

VASOS DE EXPANSION CON COMPRESOR (VEJIGA RECAMBIABLE)
EXPANSION TANKS WITH COMPRESSOR (REPLACEABLE BLADDER)
VASE D'EXPANSION AVEC COMPRESSEUR (VESSIE INTERCHANGEABLE)

PARA INSTALACIONES DE CALEFACCION Y REFRIGERACION EN CIRCUITO CERRADO SEGUN DIN - 4.751-2.
 FOR HEATING SYSTEMS AND COOLING INSTALLATIONS IN CLOSED CIRCUIT ACCORDING TO DIN - 4.751-2.
 POUR CIRCUIT FERME DE CHAUFFAGE ET REFRIGERATION SUIVANT DIN - 4.751-2.

TIPOS/TYPES: 220 - 350 - 400 - 500 - 600 - 750 - 1.000 - 1.400 - 2.000 - 3.000 - 5.000 - 10.000 - 15.000 - 20.000



DATOS TECNICOS

- 1- Orificio de inspección boca de hombre Ø 400 CMR - A - 2.000 ÷ 20.000
- 2- Válvula de seguridad R 1/4" (lado aire).
- 3- Válvula de purga (lado aire).
- 4- Conexión del sistema-red de calefacción y brida con unión flexible.
- 5- Sujeción de la vejiga.
- 6- Vejiga según DIN - 4.807.
- 7- Deposito de acero soldado.
- 8- Zapata pesadora.
- 9- Equipo de mando y control.
- 10- Compresor.
- 11- Placa de INDUSTRIA.
- 12- Purga para evacuación del aire contenido en la vejiga (lado agua).
- 13- Válvula de evacuación de aire.

CHARACTERISTICAS

- ▶ Presión máx. de servicio: 6 - 8 - 10 Bar.
- ▶ Temperatura máx. de servicio: 110 °C.
- ▶ Potencia del compresor:

200 ÷ 1.400 KW / 0,48	8 Bar.
2.000 ÷ 3.000 KW / 1,5	8 Bar.
5.000 ÷ 10.000 KW / 2,4	8 Bar.
15.000 ÷ 20.000 KW / 4	8 Bar.

TECHNICAL FACTS

- 1- Inspection hole of Ø 400 only over CMR - A - 2.000 ÷ 20.000
- 2- Safety valve R 1/4" (air side).
- 3- Vent valve (air side).
- 4- Flexible connection to heating system.
- 5- Bladder fastened.
- 6- Bladder according to DIN - 4.807 standard.
- 7- Steel welded tank.
- 8- Weight sensor.
- 9- Control panel.
- 10- Compressor.
- 11- INDUSTRY plate.
- 12- Air eliminator screw of the air contained into the bladder (water side).
- 13- Exhaust air valve.

CHARACTERISTICS

- ▶ Max. working pressure: 6 - 8 - 10 Bar.
- ▶ Max. working temperature: 110 °C.
- ▶ Compressor power:

200 ÷ 1.400 KW / 0,48	8 Bar.
2.000 ÷ 3.000 KW / 1,5	8 Bar.
5.000 ÷ 10.000 KW / 2,4	8 Bar.
15.000 ÷ 20.000 KW / 4	8 Bar.

DONNEES TECHNIQUES

- 1- Trou d'inspection bouche d'homme Ø 400 CMR - A - 2.000 ÷ 20.000
- 2- Valve de securité R 1/4" (côté d'air).
- 3- Valve de purge (côté d'air).
- 4- Raccord du système réseau chauffage et brida à tube d'union flexible.
- 5- Fixation de la vessie.
- 6- Vessie selon DIN - 4.807.
- 7- Reservoir en tôle d'acier soudé.
- 8- Sabot balance.
- 9- Equipement de commande et de contrôle.
- 10- Compresseur.
- 11- Poinçonnage du Service de Mises.
- 12- Purge d'évacuation de l'air contenu dans la vessie (côté d'eau).
- 13- Valve d'évacuation d'air.

CHARACTERISTIQUES

- ▶ Pression máx. de service: 6 - 8 - 10 Bar.
- ▶ Température máx. de service: 110 °C.
- ▶ Puissance du compresseur:

200 ÷ 1.400 KW / 0,48	8 Bar.
2.000 ÷ 3.000 KW / 1,5	8 Bar.
5.000 ÷ 10.000 KW / 2,4	8 Bar.
15.000 ÷ 20.000 KW / 4	8 Bar.

TABLA DE SELECCION DEL VASO EN FUNCION DEL CONTENIDO DE AGUA Y DE LA TEMPERATURA MEDIA
CHART FOR CHOOSE THE TANK ACCORDING TO THE AMOUNT OF WATER CONTENT AND TEMPERATURE MEAN
TABLEAU POUR LE CHOIX DU VASE EN FONCTION DU CONTENU D'EAU ET DE LA TEMPERATURE MOYENNE

Tipo Type	Capacidad Capacity Capacité Ls.	Presión máx. Trabajo Maximum working Pressure Pression max. Travail Bar	Capacidad de acumulación Absorber capacity Capacité d'accumulation Ls.	Contenido de agua de la instalación (Volumen para agua T media del Water content of the installation (Volume for water T° of Contenu en eau de l'installation (Volumen pour eau T° moyenne)				Compresor Compressor Compresseur
				70°C	80°C	90°C	100°C	
				220 AMR-C-A	200	8	190	
350 AMR-C-A	300	8	275	12	9	8	6,5	
400 AMR-C-A	400	8	380	17	13	11	9	
500 AMR-C-A	500	8	445	20	15	12,5	10	
600 AMR-C-A	600	8	575	25	20	16	13	CS 40
750 AMR-C-A	750	10	700	31	24	20	16	
1.000 AMR-C-A	1.000	10	950	41	32	26	22	
1.400 AMR-C-A	1.400	10	1.300	57	44	36	30	
2.000 CMR-A	2.000	6*	1.900	83	64	53	44	CS 60
3.000 CMR-A	3.000	6*	2.900	127	98	81	67	
5.000 CMR-A	5.000	6*	4.800	210	162	134	110	CS 100
10.000 CMR-A	10.000	6*	9.500	417	321	265	218	
15.000 CMR-A	15.000	6*	14.500	636	490	404	333	CS 150
20.000 CMR-A	20.000	6*	19.500	855	659	543	448	CS 200

* Para presión superior a 6 Bar, consultar con fábrica. * For pressure over 6 Bar, please ask factory for advice. * Pour pressions supérieures à 6 Bar, consulter le fabriquant.

NOTA: Es necesario indicar en el pedido la presión de trabajo, para montar en el vaso de expansión la válvula de seguridad de aire tarada a la presión adecuada.
NOTE: In orders for equipment, it is necessary to indicate the working pressure so that the safety valve mounted in the expansion vessel be set to the adequate pressure.
NOTE: Il est nécessaire d'indiquer sur la commande la pression de travail, afin de monter dans le vase d'expansion la soupape de sûreté d'air, tarée à la pression adéquat.

DATOS PARA LA SELECCION DE LOS VASOS DE EXPANSION

▶ Partiendo del contenido de agua de la instalación (V) y su temperatura media de trabajo, se escogerá en la TABLA el vaso adecuado, que tendrá que tener una capacidad de acumulación mayor que la dilatación del agua (D).

SIZING AN EXPANSION TANK

▶ Knowing the amount of water in the system (V) and the average temperature, choose in the CHART the suitable tank, which will need one absorber capacity bigger than the volume of water expanded (D).

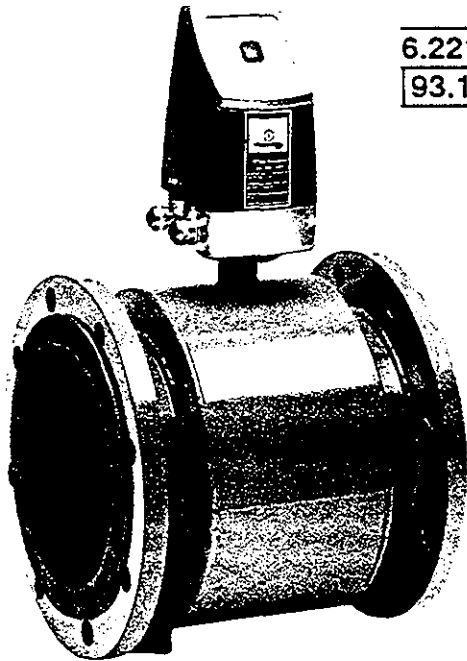
DONNEES POUR LE CHOIX DES VASES D'EXPANSION

▶ En partant du contenu d'eau de l'installation (V) et sa température moyenne de travail on choisira dans le TABLEAU le vase le plus adéquat, qui doit avoir une capacité d'accumulation plus grande que la dilatation de l'eau (D).

Volumen de dilatación del agua (D) Volume of water by expansion when heated (D) Volume de dilatation de l'eau (D) $D = V \times f_d (l)$	Temperatura media de agua en la instalación (°C) Average temperature of the water in the installation (°C) Température moyenne de l'eau dans l'installation (°C)			
	70	80	90	100
Factor de dilatación = $\frac{V_{expansión}}{V_{instalación}}$ - Coefficient de dilatación (f _d)	0,0228	0,0296	0,0359	0,0427

**GOTHATUWA – KOLONNAWA PUMP HOUSE
– ELECTROMAGNETIC FLOWMETER**

Electromagnetic Flowmeter



Special features

MAG 3100/2500

- High measuring accuracy (0.8 % of measured value)
- Wide measuring range
- Simple commissioning with SENSORPROM
- No calibration necessary
- Self diagnostics
- LCD-indicator, Current output, Pulse output
- Converter for compact/remote mounting
- ISO 9001

MAG 3100/3000

- National pattern approval for cold water, Class B
- High measuring accuracy (0.25 % of measured value)
- Wide measuring range
- Simple commissioning with SENSORPROM
- No calibration necessary
- Self diagnostics
- LCD-indicator, Current output, Pulse output
- Empty pipe indication
- Autorange
- Flow-direction signal
- Converter for compact/remote mounting
- ISO 9001
- Optional: Approval for Ex area

Application

- Measurement of water up to 95 °C (180 °C)
- Measurement of waste water
- Process control
- District metering
- Measurement of aggressive mediums and liquids with different viscosities

Models available

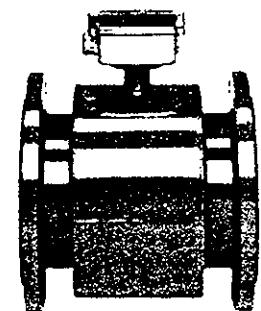
Sensor MAG 3100

DN 15 ... DN 2000	(95°C)
DN 15 ... DN 600	(180°C)
DN 15 ... DN 50	PN 40
DN 65 ... DN 150	PN 16
DN 200 ... DN 2000	PN 10
Liner:	Neoprene (Standard)
	Ebonite
	(Teflon at 180°C)
Electrodes:	AISI 316 Ti
Pipe connections	Flanges acc. to DIN 2501

Converter MAG 2500	115/230 V AC
Converter MAG 3000	115/230 V AC
Converter MAG 3000	24 V DC

- Other models on request

Converter
 MAG 2500
 MAG 3000



Sensor
 MAG 3100



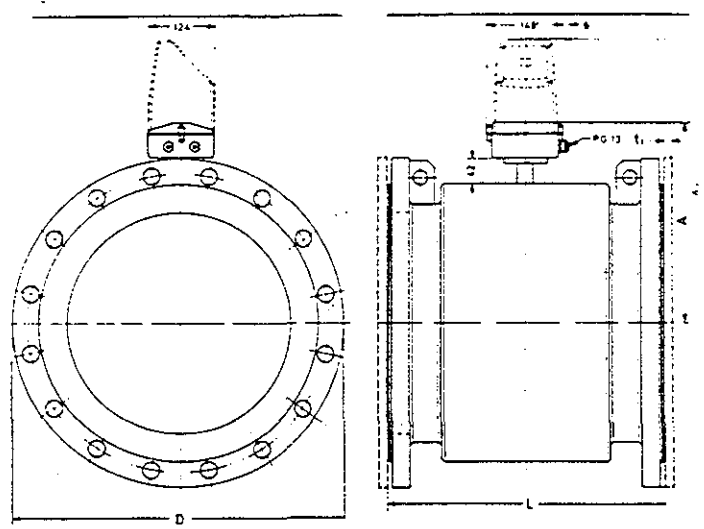
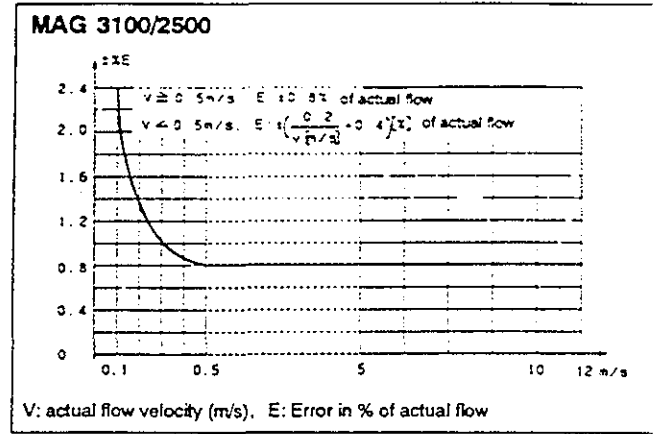
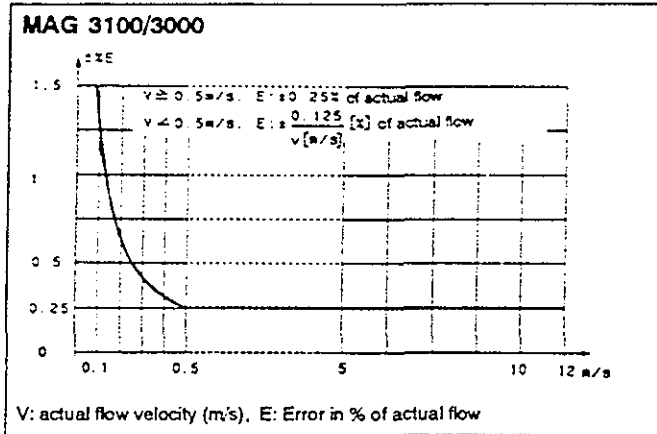
Certified Company according to DIN ISO 9001
 Laboratory Accreditation according to DIN EN 45001
 DAR Registration No. LED-P-08 001



MEINECKE

Measuring Deviation under reference conditions

(Display, Frequency, Pulse output)



Dimensions and weights

(Dimensions and weight for DN 1400, 1600, 1800 and 2000 on request)

DN mm	DIN 2501				ANSI				without MAG 3000/2500	with MAG 3000/2500	weight *) (kg)
	PN 16		PN 40		150 lb		300 lb		A	A1	
	L (**)	D	L (**)	D	L (**)	D	L (**)	D	(mm)	(mm)	
15			200	95	200	89	200	95	162	319	5
25			200	115	200	108	200	124	162	319	6
40			200	150	200	127	200	155	172	329	8
50			200	165	200	152	200	165	172	329	13
65	200	185	200	185	200	178	272	191	180	337	14
80	200	200	272	200	272	191	272	210	185	342	15
100	250	220	280	235	280	229	310	254	203	360	20
125	275	250	300	270	300	254	335	279	223	380	25
150	300	285	325	300	325	279	370	318	238	395	30
200	350	340	350	375	350	343	410	381	263	420	50
250	450	405	450	450	450	406	500	445	297	454	70
300	500	460	500	515	500	483	550	521	314	471	80
350	500	520	550	580	550	533	590	584	334	491	110
400	500	580	550	660	550	597	590	648	353	515	125
450	560	640	600	685	600	635	640	711	389	546	175
500	625	715	680	755	680	699	730	775	414	571	200
600	750	840	750	890	820	813	860	914	464	621	300
700	875	910							561	718	350
800	1000	1025							612	769	475
900	1125	1125							662	819	560
1000	1250	1255							713	870	700
1200	1500	1485							814	971	1250

All flange dimensions to DIN 2501 or ANSI B 16.5

*) With signal converter MAG 3000 mounted: Weight increases by 2 kg.

***) If earthing flanges are used, the thickness of the earthing flange and gasket must be added to the length.

Installation Requirements

- o Upstream unrestricted straight pipe min. 5 x DN
- o Downstream unrestricted straight pipe min. 3 x DN

Installation

- o May be installed at any angle
- o Pipe must always be filled with liquid.
- o Earthing flanges are necessary for non-conductive and cathodic protected pipes
- o For temperatures above 95 °C remote mounted converter is necessary

Measuring range

The table (see right) shows the relationship between flow velocity V , flow quantity Q and sensor dimension DN .

Selecting of sensor

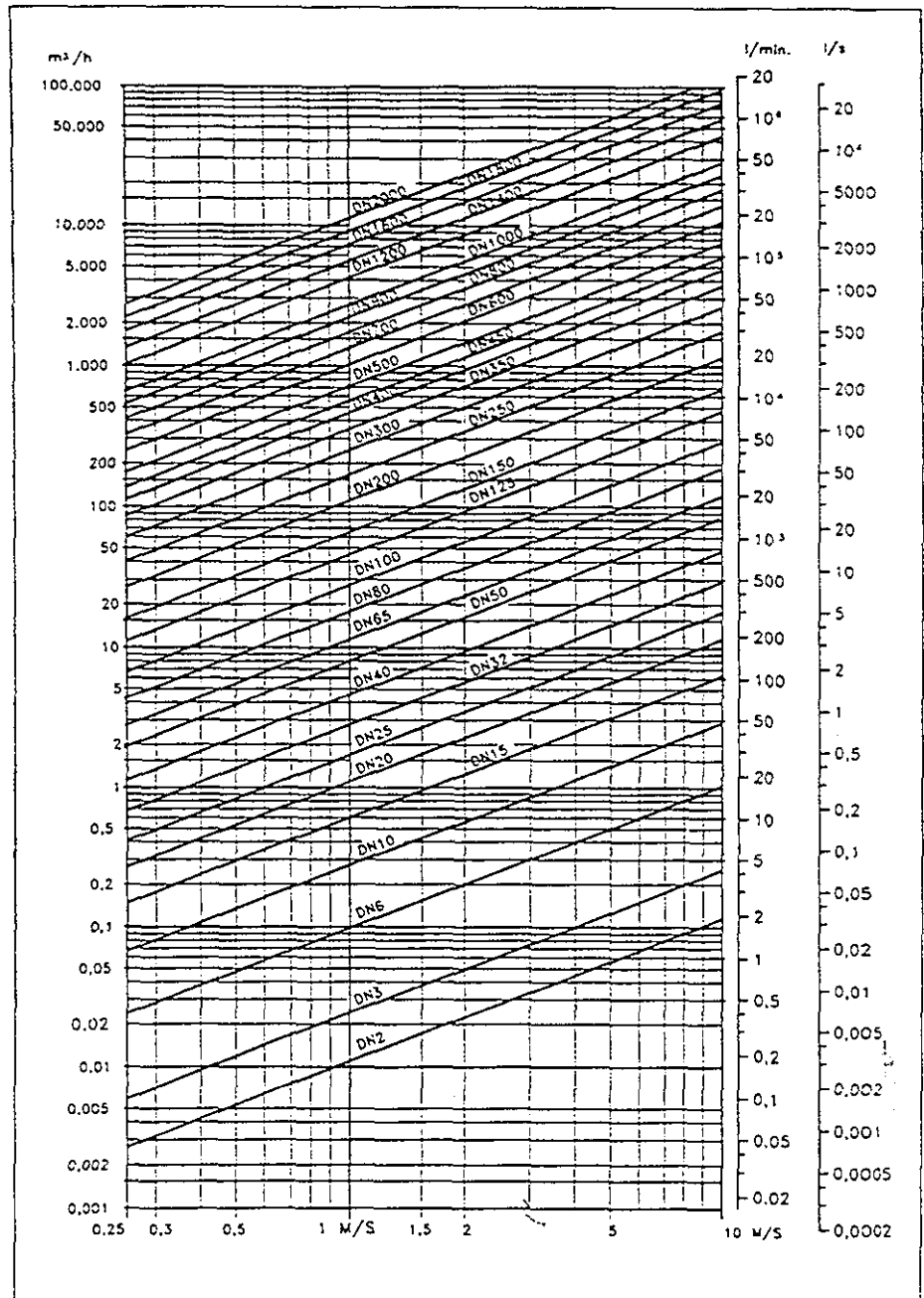
Normally, the sensor is chosen so that at full scale velocity V is 2 ... 3 m/s or more.

For measuring of mediums with high solids content V should be 3 ... 5 m/s to avoid deposition

Prerequisites

- o Medium pumpable with a conductivity of min $5\mu\text{S/cm}$, hot water above 95 °C min $130\mu\text{S/cm}$.
- o Power supply
115/230 V AC or 24 V DC.

Sizing table (DN 2 ... DN 2000)



Order Data

Sensor
MAG 3100

Other Models
and nominal sizes
DN 1400 ... DN 2000
on request

Type No.	MAG 3100 M															
1. Nominal Size DN																
15	04															
25	06															
40	08															
50	09															
65	10															
80	11															
100	12															
125	13															
150	14															
200	15															
250	15															
300	17															
350	18															
400	19															
450	20															
500	20															
600	21															
700	22															
800	23															
900	24															
1000	25															
1200	27															
2. Liner material																
Neoprene (Standard)		1														
PTFE (DN ≤ 600 mm)		3														
Ebonite		6														
3. Pressure rating																
DIN, PN 6 (Standard DN 1200)																
DIN, PN 10 (Standard DN 200 ... 1000)																
DIN, PN 16 (Standard DN 65 ... 150)																
DIN, PN 25 (available up to DN 600)																
DIN, PN 40 (Standard DN 15 ... 50, available up to DN 500)																
4. Electrode material																
AISI 316 Ti, Standard																
5. Flange material																
ST 35																
6. Protection																
IP 67 (3 m WG, 72 hours) T max. ≤ 120 °C, Standard																
IP 67 (3 m WG, 72 hours) T max. ≤ 150 °C*																
IP 67 (3 m WG, 72 hours) 150 °C ≤ T max. ≤ 180 °C**																
*) incl. protection flange type E																
**) incl. protection flange type E and extended terminal box lid																

Accessories MAG 3100

Description	Code No.
Submersible kit (IP 68 10 mWg 10 years) For use with standard MAG 3100, when sensor is buried or permanently submerged	08SU0220
Earthing/Protection flange (necessary for non conductive pipes) Typ C for all liners, excl. Teflon Typ E for liner material Teflon	Please state type, nominal size, pressure rating

Converter MAG 2500

Converter MAG 3000

Description	Application	Protection	Code No.
Converter MAG 2500 compact application (wall mounting with wall mounting kit see accessories)	115/230 V AC 50/60 Hz	IP 67 glass fibre reinforced polyamide	083F3077
		IP 00 19"-insert	083F3071
Converter MAG 3000 compact application (wall mounting with wall mounting kit see accessories)	115/230 V AC 50/60 Hz	IP 67 glass fibre reinforced polyamide	083F3012
		IP 00 19"-insert	083F3030
	24 V DC	IP 67 glass fibre reinforced polyamide	083F3016
		IP 00 19"-insert	083F3031

Accessories MAG 2500 MAG 3000

Description	Code No.	
Wall mounting kit for IP 67 version wall bracket, 5 off Pg 13 screwed cable entries, 2 x 5 m screened cable and 2 off pipe mounting brackets	083F3099	
Display window for IP 67 version with extra push button for re-setting of the internal counter	083F3008	
Standard electrode and coil cable 3 x 1,5 mm ² PVC	20 m	083F0210
	40 m	083F0211
	60 m	083F0212
	100 m	083F0213
Special electrode and coil cable double screened PVC	20 m	083F3095
	40 m	083F3094
	60 m	083F3093
	100 m	083F3092

Subject to change without notice 10/0595



MEINECKE

H. Meinecke AG
Meineckestraße
D-30880 Laatzen

Tel. (05102) 74-0
Telex 922483
Telefax (05102) 74110

Order Data

Sensor
MAG 3100

Other Models
and nominal sizes
DN 1400 ... DN 2000
on request

Type No.	MAG 3100 M														
1. Nominal Size DN															
15	04														
25	06														
40	08														
50	09														
65	10														
80	11														
100	12														
125	13														
150	14														
200	15														
250	16														
300	17														
350	18														
400	19														
450	20														
500	20														
600	21														
700	22														
800	22														
900	24														
1000	25														
1200	27														
2. Liner material															
Neoprene (Standard)															
PTFE (DN ≤ 600 mm)															
Ebonite															
3. Pressure rating															
DIN PN 6 (Standard DN 1200)															
DIN PN 10 (Standard DN 200 ... 1000)															
DIN PN 16 (Standard DN 65 ... 150)															
DIN PN 25 (available up to DN 600)															
DIN PN 40 (Standard DN 15 ... 50, available up to DN 500)															
4. Electrode material															
AISI 316 Ti, Standard															
5. Flange material															
ST 35															
6. Protection															
IP 67 (3 m WG, 72 hours) T max. ≤ 120 °C, Standard															
IP 67 (3 m WG, 72 hours) T max. ≤ 150 °C*															
IP 67 (3 m WG, 72 hours) 150 °C ≤ T max. ≤ 180 °C**)															
*) incl. protection flange type E															
**) incl. protection flange type E and extended terminal box lid															

Accessories MAG 3100

Description	Code No.
Submersible kit (IP 68 10 mWG 10 years) For use with standard MAG 3100, when sensor is buried or permanently submerged	085U0220
Earning/Protection flange (necessary for non conductive pipes) Type C for all liners, excl. Teflon Type E for liner material Teflon	Please state type, nominal size, pressure rating

Converter MAG 2500

Description	Application	Protection	Code No.
Converter MAG 2500 compact application (wall mounting with wall mounting kit see accessories)	115/230 V AC 50/60 Hz	IP 67 glass fibre reinforced polyamide	063F3077
		IP 00 19"-insert	063F3071
Converter MAG 3000 compact application (wall mounting with wall mounting kit see accessories)	115/230 V AC 50/60 Hz	IP 67 glass fibre reinforced polyamide	063F3012
		IP 00 19"-insert	063F3030
	24 V DC	IP 67 glass fibre reinforced polyamide	063F3016
		IP 00 19"-insert	063F3021

Accessories MAG 2500 MAG 3000

Description	Code No.	
Wall mounting kit for IP 67 version wall bracket: 5 off Pg 13 screwed cable entries 2 x 5 mm screened cable and 2 off pipe mounting brackets	063F3099	
Display window for IP 67 version with extra push button for re-setting of the internal counter	063F3008	
Standard electrode and coil cable 3 x 1.5 mm PVC	20 m	063F0210
	40 m	063F0211
	60 m	063F0212
	100 m	063F0213
Special electrode and coil cable double screened PVC	20 m	063F3095
	40 m	063F3094
	60 m	063F3093
	100 m	063F3092

Subject to change without notice 10 0595



MEINECKE

H. Meinecke AG
Meineckestraße
D-30880 Laatzen

Tel. (05102) 74-0
Telex 922483
Telefax (05102) 74110

GOTHATUWA PUMP HOUSE - PUMPS

LUBRA

Technical Schedule: Item 2B

Customer Name: GESCO
 Your Ref No: 08 November
 Application: Water Supply

Project Name: ~~Kotikawatta~~ Gothatuwa Pump house
 Our Ref No: EU00362

Conditions of Service

Duty Flowrate:	1080 m ³ /hr	Generated Head:	30 m
Pump Efficiency:	90.0 %	Fluid Type:	Cold Clean Water
Pump Speed:	1485 R.P.M.	Specific Gravity:	1.0
Absorbed Power:	98.1kW	Viscosity:	1.0 cpoise
N.P.S.H.R.:	6.40m	Temp. Range:	5 - 25 Deg C

Pump Construction

Pump Type:	Uniglide	Suction Dia:	400 mm
Framesize:	SDA 300/400 B	Discharge Dia:	300 mm
No. Off:	2	Flange Drilling:	BS4504 PN16
Pumpset Argmnt:	Horizontal	Sealing Argmnt:	Packed Gland
No. of Stages:	One	Seal Flush Argmnt:	Recirculating
Rotation on NDE:	AntiClockwise	Bearing Details:	Standard Bearings

Driver Ratings

Motor Type:	Squirrel Cage	Power Rating:	110kW
Motor Framesize:	280S	Insulation Class:	Class F
Enclosure:	TEFC IP55 Standard cast iron	Temperature Rise:	Class B
Motor Poles:	4 pole	A.C.Heaters:	None
Electricity Supply:	400/3/ 50 Hertz	Thermistors:	None

Materials

Pump Casing:	Cast Iron BS 1452 GR 250	Casing Wear Ring :	Bronze BS 1400 LG4
Internal Coating:	Efficiency Enhancement (PAI 5004)	Impeller Wear Rings:	Bronze BS 1400 LG4
Shaft:	St. Steel BS 970 431S29	Coupling:	Flexible Coupling
Impeller:	Bronze BS 1400 LG4	Coupling Guard:	Mild Steel
Shaft Sleeves:	Bronze BS 1400 LG4	Support:	None

Testing

Performance:	None	Witness Perf.:	None
N.P.S.H.:	None	Witness N.P.S.H.:	None
Variable Speed:	None	Witness V.S.:	None
Vibration:	None	Witness Vib.:	None
Noise:	None	Witness Noise:	None

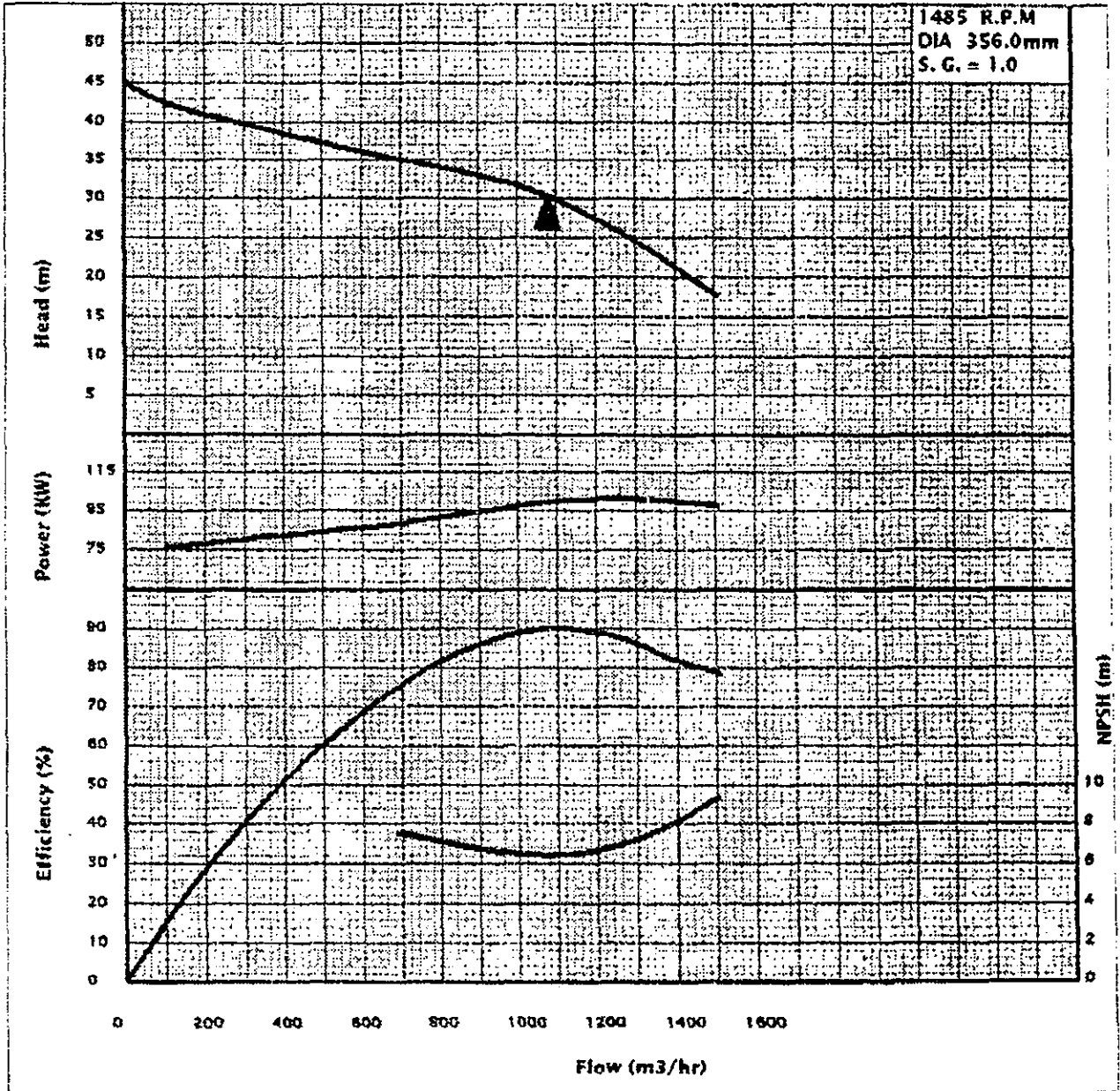
Technical Comments

WPL Tender Ref: EU00362

Performance Curve Item 2B

Horizontal Uniglide Pumpset

Pump Framesize: SDA 300/400 B, Motor Framesize: 280S



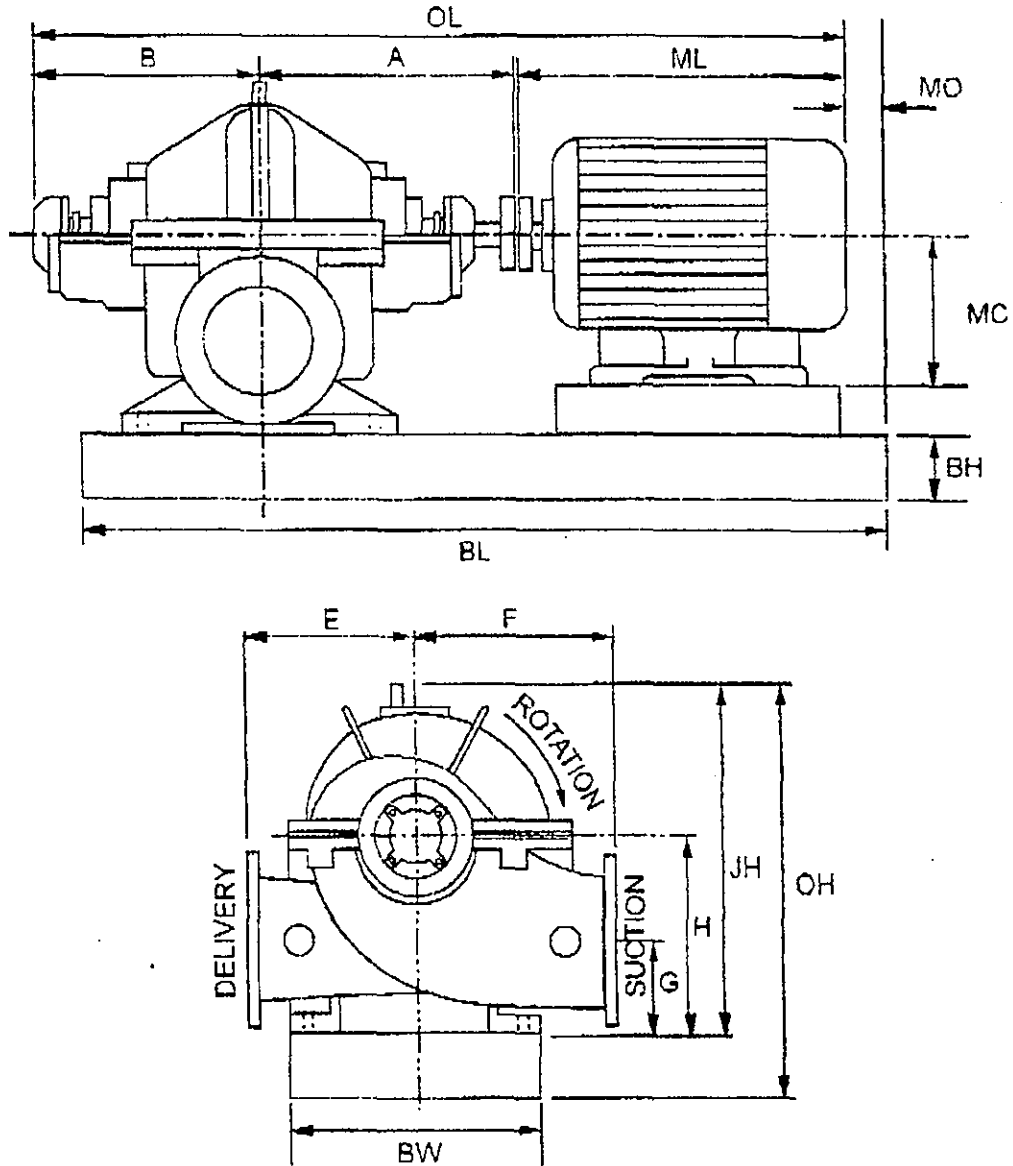
This is a preliminary Curve and all information given is for Tender Purposes Only.
This curve is based on Sample Tests with Water.

LUCAS

General Arrangement Sketch: Item 2B

Horizontal Uniglide Pumpset

Pump Framesize: SDA 300/400 B, Motor Framesize: 280S



A	B	E	F	G	H	J	ML	MC	MO	BL	BH	BW	OL	OH	Tot Weight
725	552	560	560	305	325	1073	1068	280	259	2450	206	740	2348	1279	2074

This is a preliminary drawing and all information given is for tender use only.
 Sizes given are in mm, weights are in kg, unless otherwise stated.
 Not to scale.

WPL Tender Ref: EU00362

Product Description: Item 2B

Introduction

The Uniglide is a single stage, split casing centrifugal pump. The axially split casing allows removal of the complete rotating element without disturbing the pipework or motor. Rotation is anti-clockwise when looking at the non-drive end of the pump.

Pump Arrangement

Depending upon the pump and motor combination, the pumpset is supported on a solid baseplate of either folded or fabricated design in steel. All baseplates are of rigid construction, minimising vibration.

Casing

The pump casing is axially split and ribbed for high strength and rigidity. Suction and delivery branches are cast integrally with the bottom half casing and flanges are drilled to suit individual requirements. Casing wear rings and stuffing box bushes are fitted for ease of replacement and preservation of running clearances, to maintain optimum efficiency. A joint is fitted between the two half casings to ensure a watertight seal. An air release valve is fitted at the highest point of the pump casing.

Impeller

The impeller is of double entry suction type, giving maximum suction performance and ensuring hydraulic balance. It is machined to closely maintained tolerances with the impeller vanes hand dressed to give a high quality surface finish in the water passages, and is balanced prior to assembly. A keyway extends the full length of the impeller hubs to provide a positive drive, and provision is made on the impeller necks for fitting renewable wear rings as required.

Shaft

The shaft is manufactured in high grade materials to suit all imposed stresses, and has a critical speed at least 20% above the maximum operating speed. Keyways are provided for the impeller and coupling. Renewable sleeves driven by an extension of the impeller key extend through the stuffing boxes to protect the shaft. Water throwers are fitted to prevent water ingress to the bearings. The complete shaft assembly is held together by positively locked nuts located at each end of the shaft.

Bearings

The bearing housings are carried in rigidly constructed brackets cast integrally with the bottom half casing and are doweled to provide positive location, maintaining pump alignment. The standard horizontal bearing arrangement comprises a roller bearing at the drive end of the pump, and a ball bearing at the non-drive end. The bearings are grease lubricated.

Sealing

Pumps are supplied with conventional packed glands using pre-lubricated cotton packing. The

LEANS

gland is split and can be easily removed to facilitate packing renewal. A lantern ring is fitted in the stuffing box and arranged to receive the lubricating fluid which provides a seal to prevent the ingress of air. The pumped fluid is re-circulated from the pump volute to lubricate the sealing arrangement.

Our Ref: CU/GEN/2121100
29th November 2000

Managing Director
Ceywater Consultants (Pvt) Limited
372/2 Nawala Road
Rajagiriya

Attn: Mr Karunaratne

Dear Sir,

**COST OF CUSTOMS CLEARING, TRANSPORT & COMMISSIONING OF 233 KVA
GENERATING SET AT GOTHATUWA**

We are pleased to forward our quotation for commissioning of the above generator at your site. Our quotation is inclusive of the following items.

(A)

4. Clearing, handling and documentation charges.
5. Transport to site.
6. Unloading the genset at site.

Total Cost (Item 1-3)

Rs. 45,000.00

Please note that this price does not include customs duty, GST, cess, defence levy and bank charges.

(B)

7. Supply and installation of standard cast iron earth electrodes.
8. Supply laying and termination of power/control cables from generator to changeover panel.
(Maximum distance 5 meters)
9. Supply and laying of fuel pipes from day tank to generator.
10. Supply of fuel day tank for 8 hour operation.
11. Fabrication of Radiator hot air duct. (Maximum distance between room wall and radiator 2 feet.)
12. Testing and commissioning.

Total Cost (Item 1-6)

Rs. 115,500.00

G.S.T. 12.5% (A+B)

Rs. 14,438.00

Page 2

Notes:

4. Item 3 power cables – 240 sq.mm. 4 core XLPL/PVC/PVC cables.
5. The above prices do not include the prices of any civil work, carpentry work, diesel and cable trays.
6. Load test at site will be carries out with the available load at site for a period of one hour.

PAYMENT TERMS 75% advance payment with order confirmation
 25% balance after commissioning

Yours faithfully,
TRADE PROMOTERS LIMITED

Jeevalal de Alwis
SALES EXECUTIVE

PROFORMA INVOICE

Our Ref: CU/GEN/2121100
29th November 2000

Managing Director
Ceywater Consultants (Pvt) Limited
372/2 Nawala Road
Rajagiriya
Tel : 876750
E-mail : ceywater@sif.lk

Attn: Mr Karunaratne

Dear Sir,

SUPPLY OF 01 NO CUMMINS / ONAN MODEL DFAB, 233 KVA PRIME POWER GENERATING SET
--

TECHNICAL OFFER	One No. New and complete "Cummins/Onan' model 186 DFAB, Prime rated at 233 KVA, 3 Phase; 50 Hz; 230/400 Volts at 0.8 power factor.
PRIME POWER RATING	The Prime Power rating is applicable for supplying electric Power in lieu of commercially purchased power. Prime power is the maximum power available at variable load for an Unlimited number of hours. A 10% over load capability is Available for 1 hour in every 12 hours.
ENGINE	Cummins Model LTA 10-G2 Turbo – charged, after cooled Direct injection Diesel Engine developing 272 BHP at 1500 RPM. Unit mounted tropicalized radiator system. Complete with replaceable type Fuel, Lube Oil, water and air filter elements. Electric start with 24 Volt Starter Motor and Battery Charging Alternator. Engine is governed by electronic governor.
ALTERNATOR	Brushless 4 pole Onan Alternator rated at 233 KVA. See Specification sheet for details.

ACCESSORIES

Generator Control panel consists of:-

- * **Genset Monitoring**
 - Oil Temperature
 - Battery Voltage
 - Engine Operating Hours
 - RPM Meter
- * **Engine Warning Digital Messages**
 - Low Oil pressure warning (Pre Alarm)
 - Low Coolant Temperature
 - High Coolant Temperature (Pre Alarm)
- * **Engine Shut Down Digital Messages**
 - Low Oil Pressure
 - High Coolant Level
 - Fail to Crank
 - Over crank
 - Magnetic Pickup Failure
 - Overspeed
 - Emergency Stop
- * **AC Output Metering Analogue Meters**
 - AC Voltmeter
 - AC Ammeter
 - Frequency Meter
 - Kilowatt Meter
 - Phase Selector Switch
- * **Digital Metering**
 - AC Voltage (3 Phase)
 - AC Current (3 Phase)
 - Power Factor
 - AC Kilowatt
 - AC Kilowatt Hours
 - Main Alternator Exciter Duty Level
 - AC Frequency
- * **Amp Sentry Protection**
 - Amp Sentry Warning Digital Messages**
 - Overload Alarm
 - Overcurrent
 - Amp Sentry Shutdown Digital Messages**
 - High AC Voltage
 - Low AC Voltage
 - Overcurrent
 - Short Circuit
 - Battery Warning Digital Messages**
 - Low DC Voltage
 - High DC Voltage
 - Weak Battery

- * Residential Heavy duty Muffler
- * Stainless Steel Flexible connector
- * Run/Off/Auto Switch
- * Alternator Heater
- * Batteries
- * Manuals

PRICE **CIF Colombo: for 1 unit US\$ 25,500.00**
(US\$ Twenty Five Thousand Five Hundred Only)

OPTIONAL 500 Amp 4 pole AMF/ATS Panel complete with 4 x Indicator lamps.
Add to CIF Price US\$ 4150.00
(US\$ Four Thousand One Hundred & Fifty Only)

Generally in accordance with Manufacturers' standard specification sheet attached.

VALIDITY 30 days from date of offer

DELIVERY Approximately 8 weeks from the date of receipt of acceptable letter of credit at our Principals. However delivery can be improved subject to order confirmation.

TERMS OF PAYMENT By confirmed Irrevocable letter of credit in favour of:

CUMMINS POWER GENERATION (S) PTE LIMITED
44 PIONEER SECTOR 2
SINGAPORE 628395

All Bank Charges to applicant's account.

WARRANTY 12 months from date of commissioning at site.

COUNTRY OF ORIGIN SINGAPORE

Yours faithfully,
TRADE PROMOTERS LIMITED

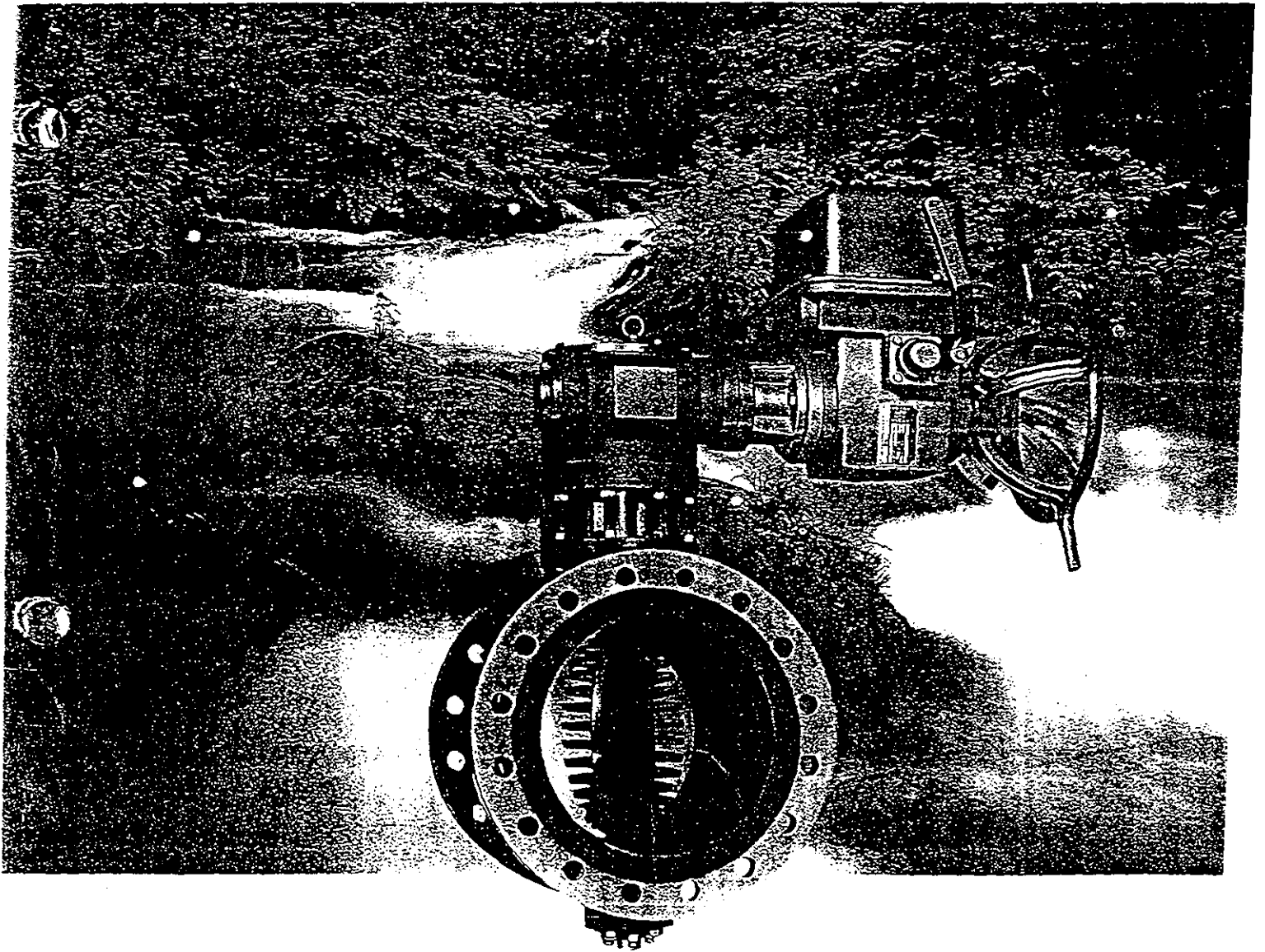
Jeevaial de Alwis
SALES EXECUTIVE

**GOTHATUWA PUMP HOUSE
- FLOW CONTROL VALVE**

維持管理時代の新しいバタフライ弁

LO-TM

バタフライ弁の流れを変える…ローティエム



504



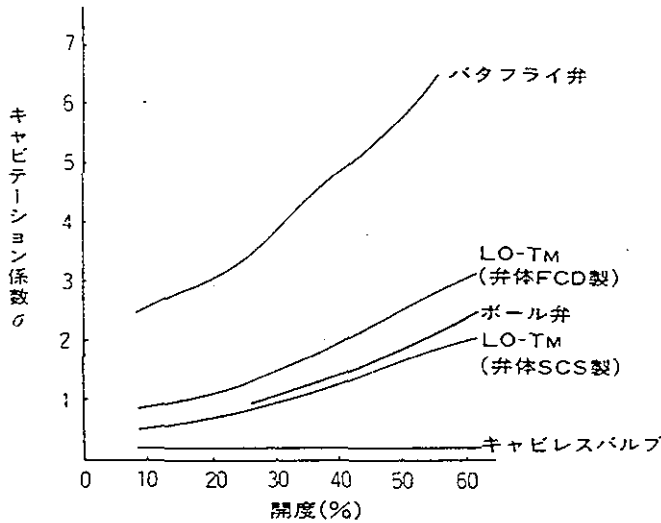
Maezawa Industries, Inc.

幅広い流量制御特性を実現。

性能

絞り運転が可能となりました。

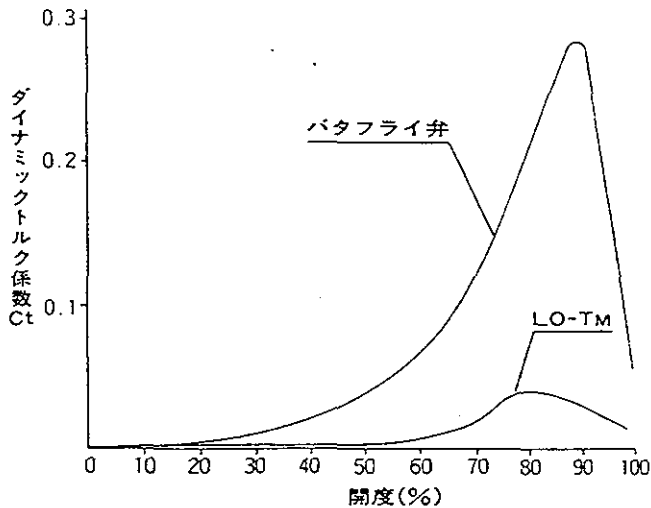
●各種弁のキャビテーション特性



水道用バタフライ弁は通常全閉・全開で使われますが、LO-TMはくし歯が水流を細かい流れに分散させるため、キャビテーションの成長を抑え絞り運転を可能としました。

低ダイナミックトルクで安定した制御。

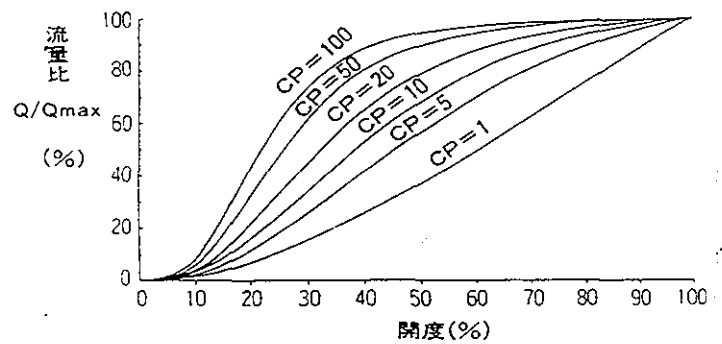
●ダイナミックトルク係数(Ct)特性



水道用バタフライ弁は非常に高いダイナミックトルクを示しますが、LO-TMは弁体の特殊形状により、ダイナミックトルクを減少、安定した制御性を発揮、減速機の負担を軽くいたします。

LO-TM流量特性

●LO-TM流量特性(流量比Q/Qmax)

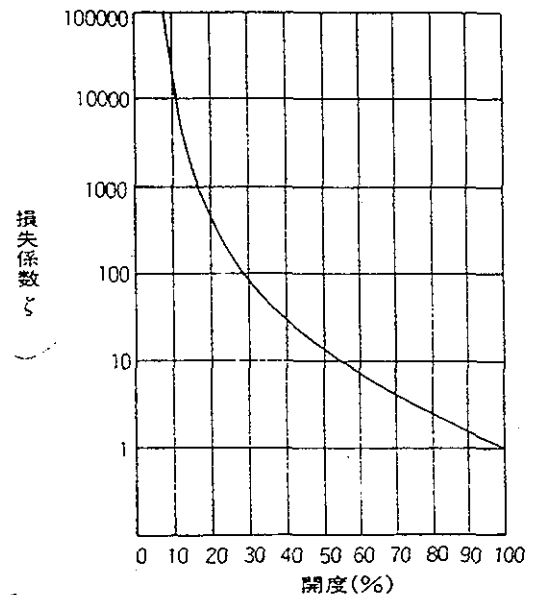


流量コントロール特性は弁の各開度の流量に対する最大流量(弁全開)の比であらわされます。

$$\frac{Q}{Q_{\max}} = \sqrt{\frac{\zeta_{\min} + CP}{\zeta + CP}} \quad CP: \text{配管系損失係数}$$

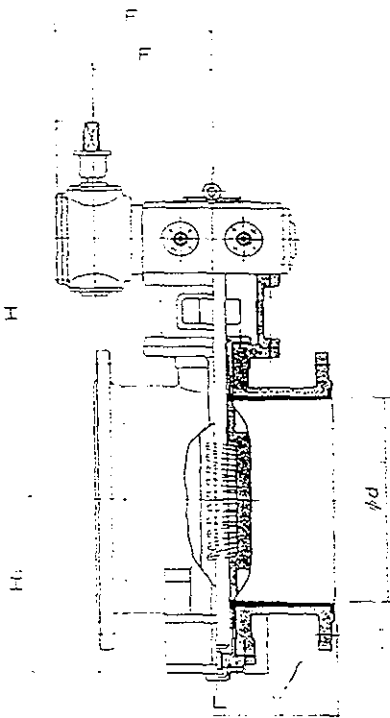
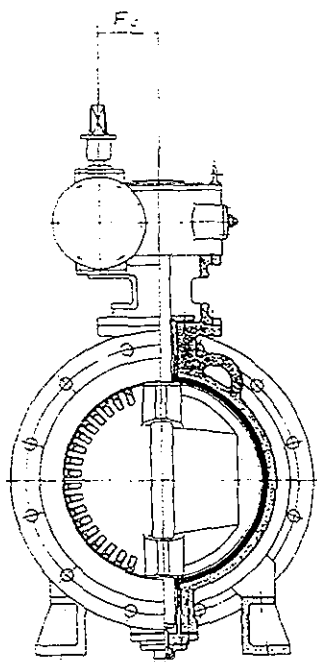
LO-TMの損失係数

●LO-TMの損失係数



ゴムライニングを施し完全止水。

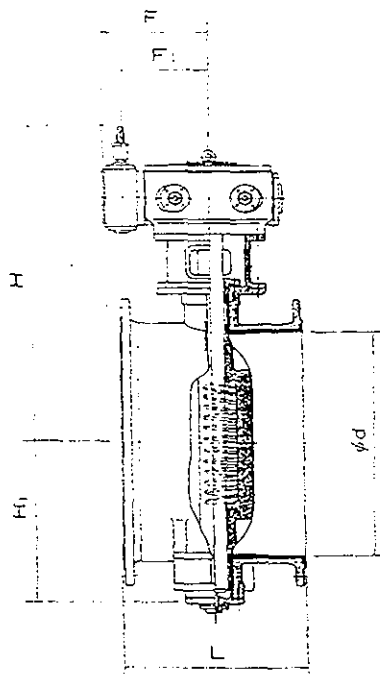
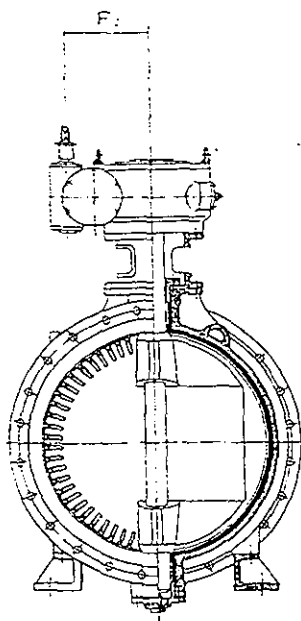
■外形寸法図 手動式立型



φ150~φ1000mm

(単位→)

口径 (mm)	L	H	全高	φd	φD	φE
150	280	—	605			
200	300	—	635			
250	380	240	640	279	200	92
300	400	270	645			
350	430	300	715			
400	470	350	740/775	279/328	200/245	92/130
450	500	375	810	328	245	130
500	530	400	860	328	245	130
500	560	450	920/945	328/358	245/270	130/150
700	610	500	1038	358	270	150
800	690	550	1203			185
900	740	600	1293	428	325	185
1000	770	650	1358			



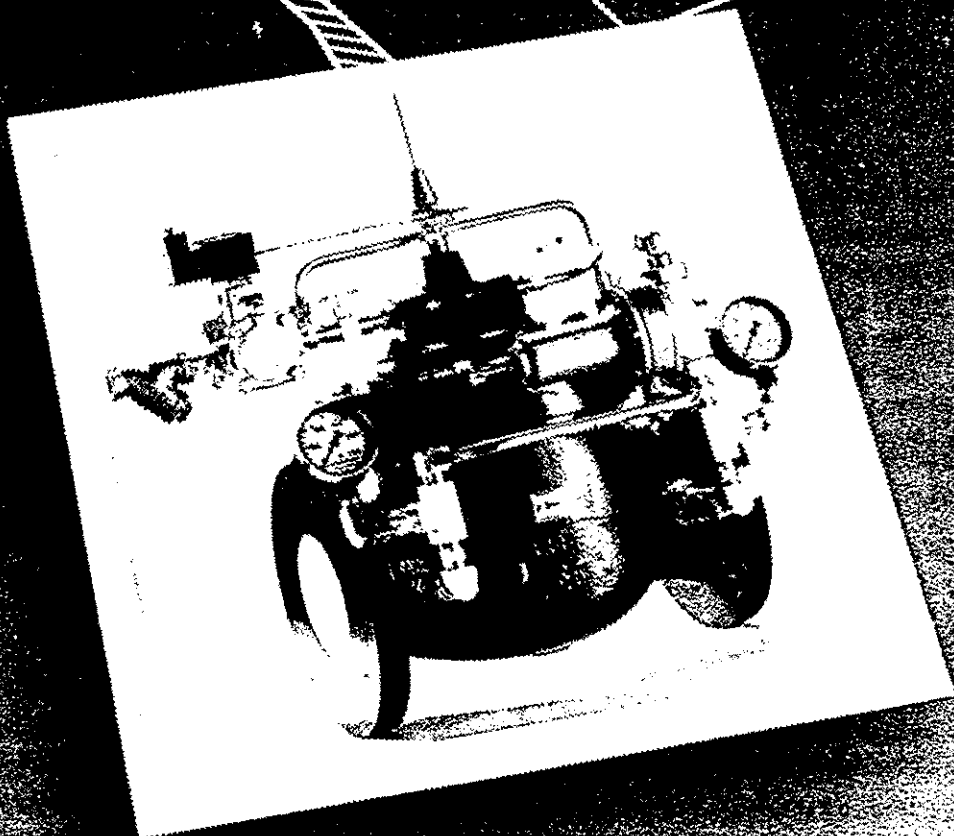
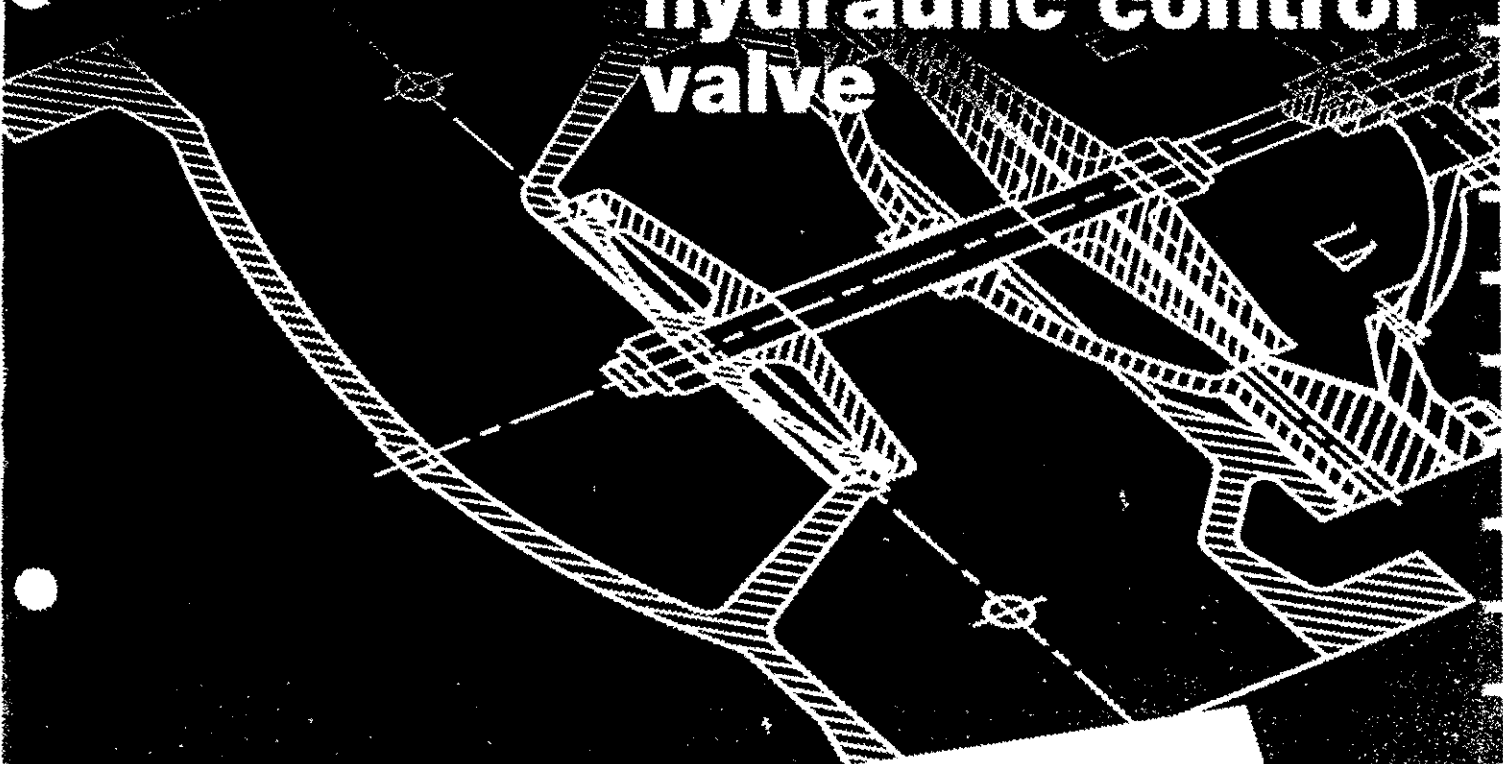
φ1000mm

(単位→)

口径 (mm)	L	H	全高	φd	φD	φE
1000	770	650	1340	457	365	200

BAKER

Automatic hydraulic control valve



PREMIER



VALVES

507

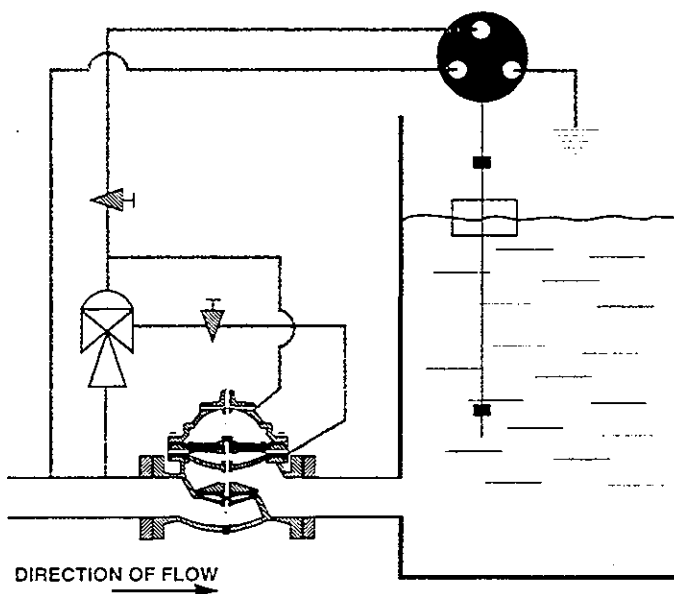
BAKER POWER CHAMBER HYDRAULIC CONTROL VALVE

POWER CHAMBER FEATURE ON/OFF

Although this can be used for modulating control, the most common use for this feature is to permit the valve to open when the supply pressure is low. The valve bias spring is omitted in this arrangement and it is essential that the valve is supplied with slow closing speed control to prevent water hammer.

Supply pressure is fed both under the valve seat and under diaphragm via a 3-way pilot to the lower diaphragm chamber. This provides relatively large valve opening forces even at low supply pressure. To close, the supply pressure is switched to the upper diaphragm chamber.

Fig. 510 FLOAT LEVEL CONTROL



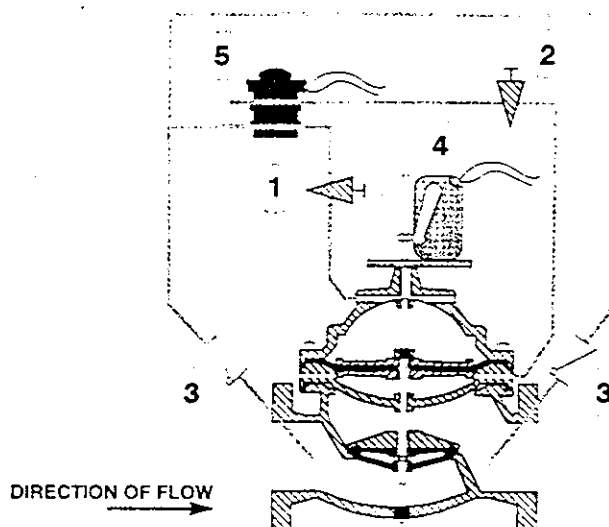
Both the main valve and the 3-way pilot are controlled by a rotary pilot which is actuated by the movement of a float through a bell-crank lever.

The float moves along an extension rod onto which are fixed collars at the desired top and bottom water levels. The assembly is balanced by a counterweight.

On reaching the bottom water level collar, the pilot is opened and drains both the pilot diaphragm and the top chamber of the main valve and this permits supply pressure both under the valve seat and under the diaphragm of the main valve. This upward thrust opens the main valve fully, allowing water to flow into the reservoir.

On reaching the top water level, the rotary pilot closes, isolating the drain connection and permitting the supply pressure into the diaphragm of the 3-way pilot and also the top chamber of the main valve. At the same time, the bottom chamber of the main valve is drained. The downward thrust closes the valve at a speed determined by the needle valve.

Fig. 513-5 BOOSTER PUMP CONTROL



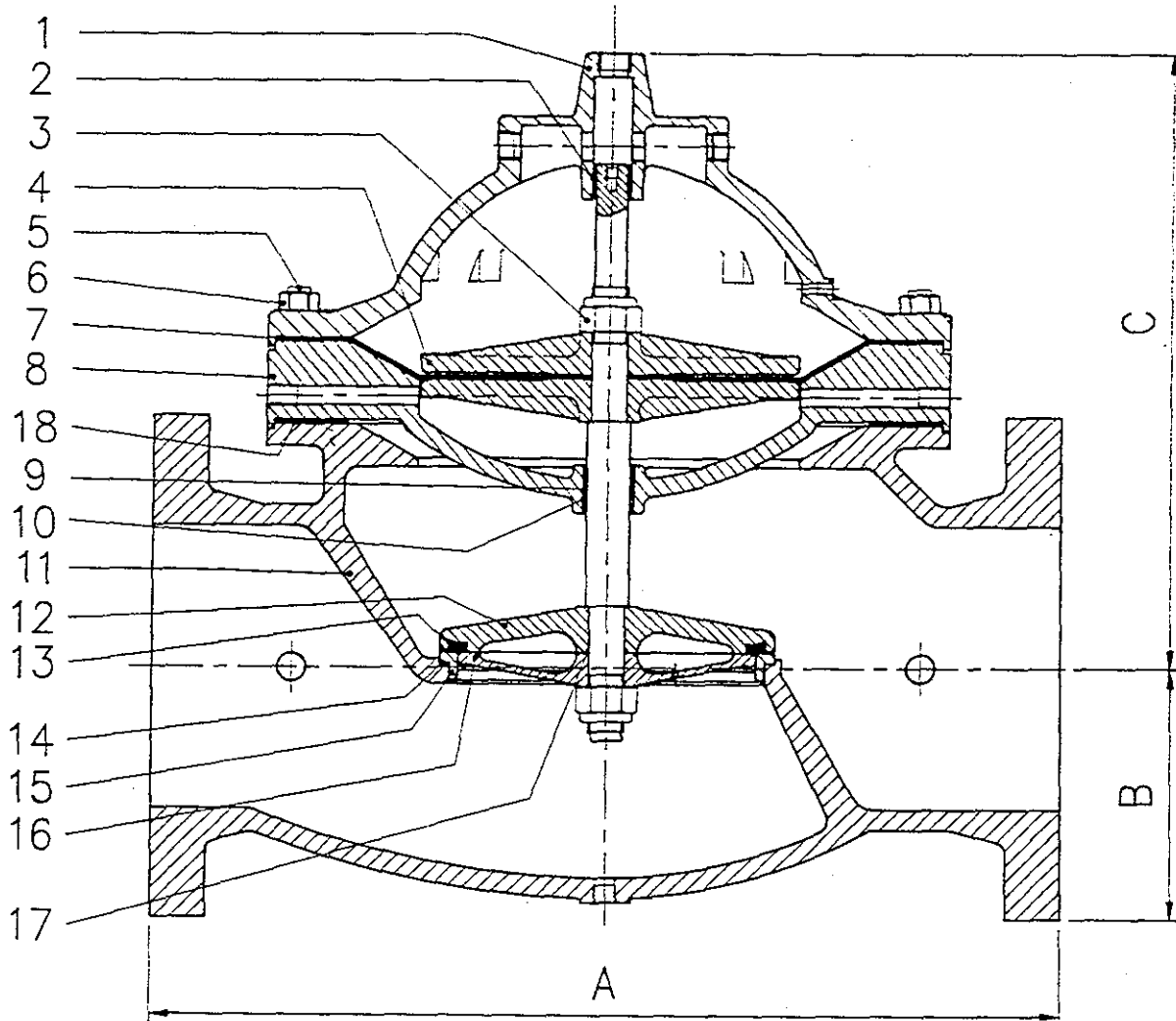
Depressing the pump starter button starts the pump motor and energises the solenoid pilot valve (5) permitting supply pressure under the main valve diaphragm. The moment the flow starts, the main valve slowly begins to open and the limit switch (4) circuit closes and over-rides the starting switch circuit. The valve continues to open.

Depressing the pump starter switch button de-energises the solenoid pilot valve (5) and relieves the pressure in the bottom diaphragm chamber to atmosphere. Back pressure from the line is maintained in the top chamber and the valve closes slowly. The limit switch circuit is broken as the valve closes and the pump motor stops.

In the event of electric failure, the motor and solenoid pilot valve are de-energised and the same sequence occurs, the back pressure from the line being passed into the top diaphragm chamber and the valve closes tight.

1. Flow Control Valve (Opening Speed)
2. Flow Control Valve (Closing Speed)
3. Check Valve
4. Limit Switch
5. Solenoid Valve, 4-way

BAKER POWER CHAMBER HYDRAULIC CONTROL VALVE



MATERIALS OF CONSTRUCTION (minimum specification)

COMPONENTS	SPECIFICATIONS
1. Cover	S.G. 420/12
2. Bearing	Phosphor Bronze
3. Stem Nut	Stainless steel
4. Diaphragm washer	S.G. 420/12 or Bronze.
5. Stud	Grade 8.8 Galv.
6. Nut	Grade 8.8 Galv.
7. Diaphragm	Buna N
8. Inner Cover	S.G. 420/12
9. O' ring	Nitrile Rubber
10. Bearing	Phosphor Bronze
11. Body	S.G. 420/12
12. O' ring retainer	S.G. 420/12 or Bronze
13. O' ring	Nitrile Rubber
14. Seat Gasket	Silicone
15. Seat Ring	Stainless Steel
16. O' ring washer	Stainless Steel/Bronze
17. O' ring	Nitrile Rubber
18. Gasket	CAF

DIMENSIONAL DATA

SIZE	A	B	C	MASS
50	216	83	161	12,7
80	286	105	206	36
100	359	127	250	55
150	454	159	355	121
200	584	191	485	254
250	791	222	539	449
300	902	260	609	686
350	1029	324	661	984
400	1105	394	761	1438

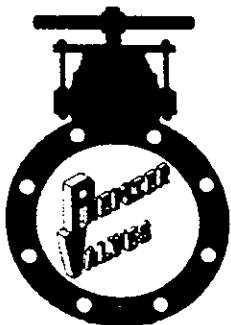
BAKER POWER CHAMBER HYDRAULIC CONTROL VALVE



An unending approach to quality, attention to detail, commitment to service and a desire to be the market leader in the water reticulation industry is what sets the Baker Control valve apart.

Baker Control Valves, together with all other Premier Valves products, are made to recognised international standards and manufactured under stringent control management systems, complying and accredited under ISO 9002.

Over 40 years of experience in this field enables us to provide the industry with the kind of service it has come to expect from Premier Valves. Service which begins in the drawing office and does not end on delivery, but continues throughout the life of the system.



PREMIER VALVES (PTY)LTD

Head Office:

P.O. Box 11735, Randhart 1457.

Telephone: (011) 908-3760.

Fax: (011) 908-3700

Branches:

Durban, Cape Town, Welkom,
Port Elizabeth, East London
Klerksdorp.

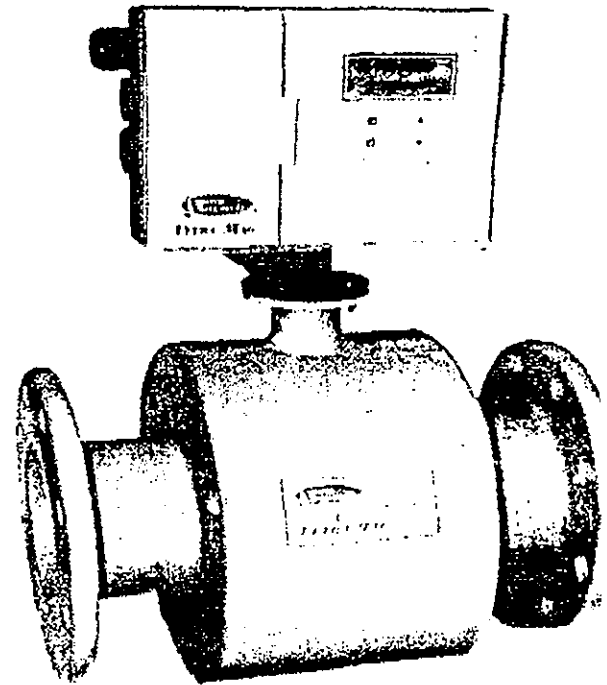
**GOTHATUWA PUMP HOUSE
- ELECTROMAGNETIC FLOWMETER**

Mr. Roberts.

From: NIVAL PERERA

ELECTROMAGNETIC METER

- ◆ Microprocessor Based Signal Converter
- ◆ Preprogrammed at the Factory
- ◆ NIST Traceable Wet Flow Calibrated
- ◆ Accuracy ± ½% of Actual Flow
- ◆ Velocity Range: .2 to 34 FPS
- ◆ Self Diagnostic Test Mode
- ◆ NSF Approved Fusion Bonded Liner
- ◆ Pressure Rating: 150 PSI, optional 300 PSI
- ◆ Resettable Totalizer
- ◆ Two Programmable Alarm Outputs
- ◆ Configuration Parameters Lockout Protected
- ◆ Forward & Reverse Flow Indication & Totalization
- ◆ Backlit Display Continuously Displaying Rate of Flow & Total Volume
- ◆ CSA Approved



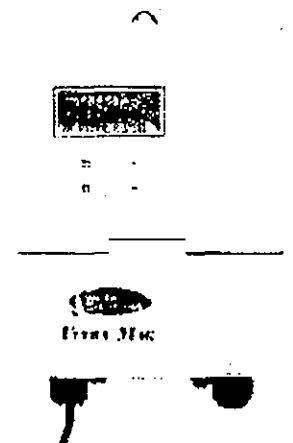
Model 4" UM-06

HIGH ACCURACY ◆ NON INTRUSIVE FLOW MEASUREMENT

The latest technology to offer very low flows and rangeability for use in:

OPTIONAL:

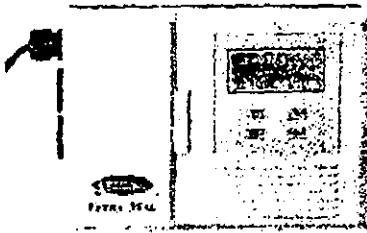
- ◆ Remote Mounting Kit for Signal Converter (Up to 300 ft.)
- ◆ Bi-Directional Scaled Pulse & 4-20 mA Analog Outputs
- ◆ Separate 4-20 mA Output for Reverse Flow
- ◆ "Hart" Protocol Compatible
- ◆ Submersible and Buriable Flow Sensors (NEMA 6)
- ◆ 300 PSI Service
- ◆ 316 Stainless Steel Grounding Rings
- ◆ Complete Line of Instrumentation



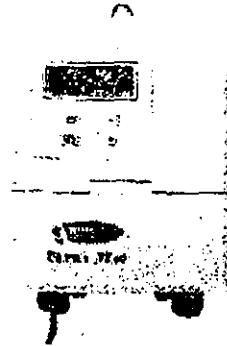
STANDARD REMOTE MOUNT SIGNAL CONVERTER

023 3105

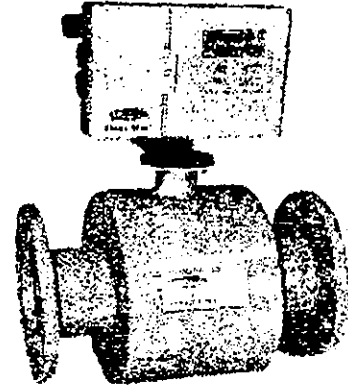
MODEL UM-06
UltraMag™ ELECTROMAGNETIC FLOW
 METER
 150 psi FLANGED TUBE METER
 SIZES 2" thru 48"



TYPICAL SENSOR MOUNT
 SIGNAL CONVERTER



TYPICAL REMOTE MOUNT
 SIGNAL CONVERTER



DESCRIPTION

MODEL UM-06 FLANGED TUBE **UltraMag™** meters are manufactured to the highest standard available for magmeters. They incorporate microprocessor technology to offer very low flows, broad rangeability and are CSA approved. The flanged end tube design permits use in a wide range of applications with up to 150 PSI working pressure. Flanged ends are Class "D" flat face flanges. The fabricated tube is stainless steel with steel or stainless steel flanges and is NSF approved for non-bonded epoxy lined.

INSTALLATION is made similar to placing a short length of flanged end pipe in the line. The meter can be installed vertically, horizontally, or inclined on suction or discharge lines. The meter must have a full pipe of liquid for proper operation. Fully opened gate valves, fittings, or other obstructions that tend to set up flow disturbances should be a minimum of five pipe diameters upstream and two pipe diameters downstream from the meter. Fluid must be ground to sensor using Water Specialist grounding rings).

SIGNAL CONVERTER. All converters, indicators, totalizers and 4-20 mA transmitters are factory programmed for every meter at desired requirements. The microprocessor-based signal converter has a self diagnostic test mode. It features a backlit display that continuously displays "Rate of Flow" and "Total Volume". The signal converter configuration parameters are lockout protected, but can be changed via the front panel keypad or with the use of a personal computer or electronic organizer with a 9-pin RS232 serial interface port. It is compatible with Microsoft Windows and many other software programs with built in terminal communication capabilities. The signal converter may be provided with optional "Hart" compatible protocol. The converter is installed on the meter in a sealed NEMA 4X case.

- OPTIONAL** Complete line of instrumentation.
- Remote Mounting Kit to locate signal converter away from meter (Max. 300 ft)
 - Separate 4-20 mA output for reverse flow
 - "Hart" protocol compatible converter
 - Submersible and buryable flow sensors (NEMA 6)
 - 316 SS Grounding Rings
 - 300 psi Service (Model UM-06)

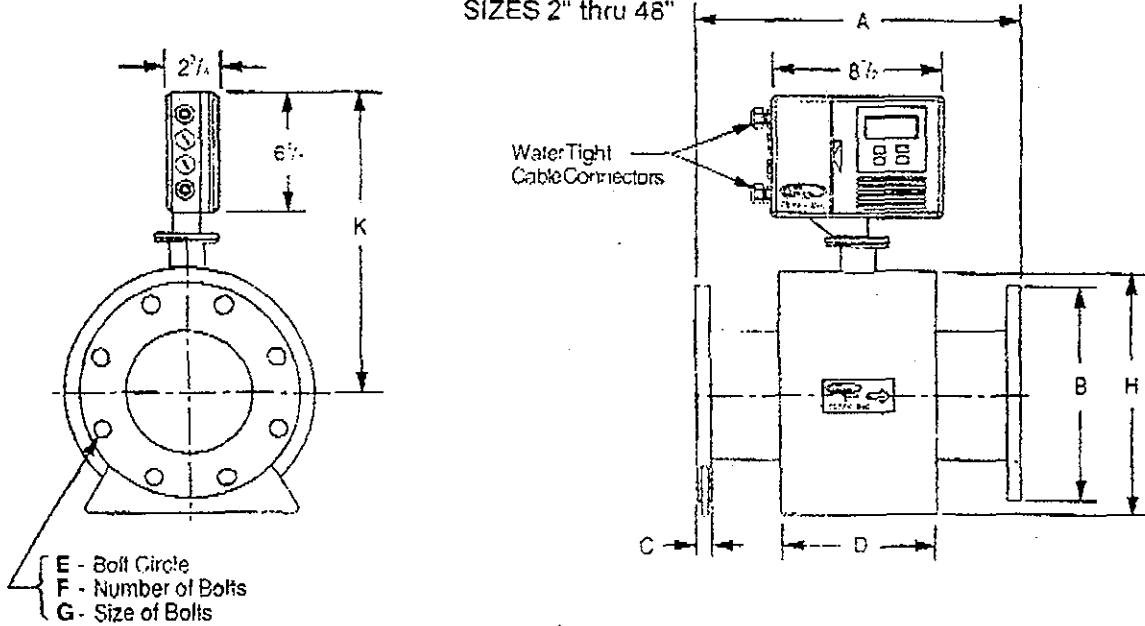
SPECIFICATIONS

WARRANTY	2 Years.
ACCURACY TESTS	3-point wet flow calibration of every complete flow tube with its signal converter. The test facility is certified regularly to an accuracy of plus or minus 0.2% and is traceable to the National Institute of Standards and Technology. If desired, the tests can be witnessed by the customer.
ACCURACY	Plus or minus 0.5% of actual flow.
REPEATABILITY	0.1%
HEAD LOSS	None. No obstruction in line and no moving parts.
PRESSURE RANGE	150 PSI maximum working pressure. Consult factory for high pressure requirements.
TEMPERATURE RANGE	150° F Maximum. Consult factory for special construction for higher temperatures.
VELOCITY RANGE	2 to 34 FPS.
BI-DIRECTIONAL FLOW	Forward and reverse flow indication and totalization are standard with all meters.
AUTO ZERO	Pulsed DC field excitation principle.
CONDUCTIVITY	5 us/cm.
LINER	NSF approved, fusion bonded epoxy.
ELECTRODES	Type 316 stainless steel, others optional.
POWER SUPPLY	120 or 240 VAC, negligible effect with power supply variation, 50-60 cycle.
ANALOG OUTPUT	Isolated 4-20 mA into 800 ohm load max.
FREQUENCY OUTPUT	0-800 HZ frequency and scaled pulse
EMPTY PIPE SENSING	Zero return when electrodes are uncovered.
ALARMS	Two programmable alarm outputs.
DIGITAL TOTALIZER	Numbers reading in gallons, cubic feet, litres, cubic meters or imperial gallons. Equipped with electronic resettable totalizer.
DIGITAL RATE INDICATOR	Numbers reading in GPM, CFS, MGD or most common liquid measuring units.
REMOTE MOUNTING	Standard meters have signal converter integral with meter tube but it may be mounted up to 300 feet away from the meter depending on liquid conductivity.



MODEL UM-06
ULTRAMAG™ ELECTROMAGNETIC FLOW
METER

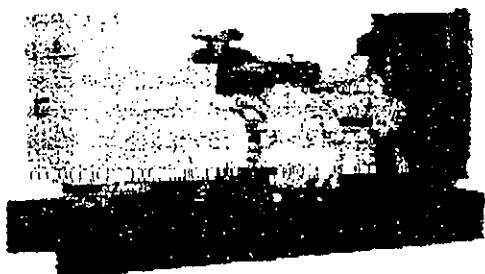
150 psi FLANGED TUBE METER
 SIZES 2" thru 48"



METER & PIPE SIZE	FLOW RANGES, GPM STANDARD .2 TO 34 FPS MIN. - MAX.	DIMENSIONS									SHIPPING WEIGHT POUNDS
		A	B	C	D	E	F	G	H	K	
2	2 - 352	11.0	6	.625	6.7	4.75	4	.625	7.9	12.75	55
3	5 - 831	13.4	7.5	.687	6.7	6	4	.625	9.4	13.75	70
4	8 - 1440	13.4	9	.687	6.7	7.5	8	.625	10.4	14.25	85
6	19 - 3259	14.6	11	.687	6.7	9.5	8	.750	12.5	15.25	158
8	33 - 5636	16.1	13.5	.687	9.5	11.75	8	.750	15.7	16.9	230
10	52 - 8864	18.5	16	.687	9.5	14.25	12	.875	17.8	18	264
12	74 - 12572	19.7	19	.812	9.5	17	12	.875	19.4	18.75	328
14	90 - 15223	21.7	21	.937	12.0	18.75	12	1.00	20.3	19.5	442
16	118 - 20058	23.6	23.5	1.00	14.2	21.25	16	1.00	21.10	20.5	458
18	150 - 25560	23.6	25	1.062	14.2	22.75	16	1.125	21.10	21	580
20	185 - 31532	25.6	27.5	1.125	16.2	25	20	1.125	24.8	22.5	681
24	268 - 45574	30.7	32	1.25	21.7	29.5	20	1.25	29.4	24.5	815
30	420 - 71337	35.8	38.75	1.375	25.5	36	28	1.25	35.9	27.5	1330
36	609 - 103573	46.1	46	1.625	25.6	42.75	32	1.50	42.7	31	1450
42	834 - 141803	46.1	53	1.75	29.9	49.5	36	1.625	47.3	33	1600
48	1094 - 186025	47.2	59.5	1.875	35.0	56	44	1.625	55.6	37	2240

**GOTHATUWA PUMP HOUSE
- DIESEL GENERATOR**

CATERPILLAR



Shown with
Optional
Equipment

FEATURES

- **COMPLETE, READY-TO-RUN SYSTEM**
 - Full-featured system includes: integral fuel tank, exhaust silencer and flex, charging alternator, batteries, battery rack and cables, and main line circuit breaker
 - Fully operable upon delivery, just add fuel and power cables
- **FULL RANGE OF ATTACHMENTS**
 - Wide range of built on system expansion attachments, factory designed and tested
- **SOUND ATTENUATED ENCLOSURE**
 - Factory complete, ready-to-run (optional)
- **SINGLE-SOURCE SUPPLIER**
 - Complete systems designed and built at Caterpillar ISO certified facilities
 - Certified Prototype Tested with torsional analysis
- **WORLDWIDE PRODUCT SUPPORT**
 - Worldwide parts availability through the Caterpillar dealer network
 - With over 1,200 dealer outlets operating in 166 countries, you're never far from the Caterpillar part you need.
 - 99.5% of parts orders filled within 48 hours. The best product support record in the industry.
 - Caterpillar dealer service technicians are trained to service every aspect of your electric power generation system.
 - Preventive maintenance agreements
 - The Cat Scheduled Oil Sampling (S-O-S™) program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products
- **MEETS OR EXCEEDS INTERNATIONAL SPECIFICATIONS: ABGSM TM3, AS 1359, AS2789, BS4999, BS5000, BS5514, DIN6271, DIN6280, EGSA101P, IEC 34/1, ISO3046/1, ISO8528, JEM1359, NEMA MG1-22, VED0530, 89/392/EEC, 89/336/EEC**

Generator Set

365 kV·A
1500 rpm
50 Hz

Prime Power

Caterpillar is leading the power generation marketplace with Package Generator Sets engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

- **CAT® 3406 DIESEL ENGINE**
 - Reliable, rugged, durable design
 - Field-proven in hundreds of thousands of applications worldwide
 - Four-stroke-cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight
- **CAT® SR4B GENERATOR**
 - Designed to match performance and output characteristics of Caterpillar diesel engines
 - Optimum winding pitch for minimum total harmonic distortion and maximum efficiency
 - Segregated AC/DC, low voltage accessory box provides single point access to accessory connections
- **CAT® CONTROL PANELS**
 - Three levels of controls, designed to meet individual customer needs
 - Common enclosure and wiring harness equipped with quick disconnects allows easy retrofit
 - Switchgear conversion and electromechanical panels provide accurate analog monitoring and metering with basic system protection
 - Microprocessor based Electronic Modular Control Panel (EMCP II and EMCP II+) use digital gauges and true RMS monitoring to provide advanced monitoring, metering, control, and protective relaying capabilities. Fully compatible with Caterpillar annunciators, and remote communication and expansion modules.



365 kV·A GENERATOR SET



TECHNICAL DATA

365 kV·A/292 kW Prime Power Generator Set - 1500 rpm/50 Hz

Package Performance		
Power rating @ 0.8 PF with fan	kV·A	365
Power rating @ 0.8 PF with fan	kW	292
Fuel Consumption		
100% Load with Fan	L/hr	78.4
75% Load with Fan	L/hr	59.0
Cooling System		
Ambient Air Temperature (Consult T.M.I.)	Deg C	50
Air Flow Restriction (After Radiator)	kPa	.06
Standard Radiator Arrangement Data		
Air Flow (Max @ Rated Speed)	m ³ /min	629
Engine Coolant Capacity with Radiator	L	104.1
Engine Coolant Capacity without Radiator	L	34.1
Exhaust System		
Combustion Air Inlet Flow Rate	m ³ /min	21.7
Exhaust Gas Stack Temperature	Deg C	574
Exhaust Gas Flow Rate	m ³ /min	64.3
Exhaust Flange Size — (Internal Diameter)	mm	152
System Backpressure (Max. Allowable)	kPa	6.7
Heat Rejection		
Heat Rejection to Coolant (Total)	kW	179
Heat Rejection to Exhaust (Total)	kW	268
Heat Rejection to Atmosphere from Engine	kW	62
Heat Rejection to Atmosphere from Generator	kW	19.9

Duration: Generator set is designed to operate in ambient temperatures up to 50° C (122° F) and at higher altitudes. Please consult factory for available outputs.

CAT® 450 FRAME GENERATOR SPECIFICATIONS

Type . . . Self excited, static regulated, brushless
 Construction . . . Single bearing, close coupled
 Three phase 12 lead reconnectable
 Insulation Class H with tropicalization and antiabrasion
 Enclosure Drip proof IP22
 Alignment Pilot shaft
 Overspeed capability 150%
 Wave form Less than 5% deviation
 Paralleling capability With optional droop transformer
 Voltage regulator 3-phase sensing with Volts-per-Hertz
 Voltage regulation . . . Less than ± 1/2% (steady state)
 Less than ± 1% (no load to full load)
 Voltage gain Adjustable to compensate for engine speed droop and line loss
 TIF Less than 50
 THD Less than 5%

CAT® 3406 TA ENGINE SPECIFICATIONS

1-6, 4-Stroke-Cycle Watercooled Diesel
 Bore — mm (in) 137 (5.4)
 Stroke — mm (in) 165 (6.5)
 Displacement — L (cu in) 14.6 (893)
 Compression ratio 14.5:1
 Aspiration Turbocharged-Aftercooled

CAT® CONTROL PANEL

24 Volt DC Control
 NEMA 1, IP22 enclosure
 Electrically dead front
 Lockable hinged door
 Generator instruments meet ANSI C 39.1
 Terminal box mounted
 Single location customer connector point
 EIC compliant — segregated AC/DC connection

Consult your Caterpillar dealer for available voltages.

3/5

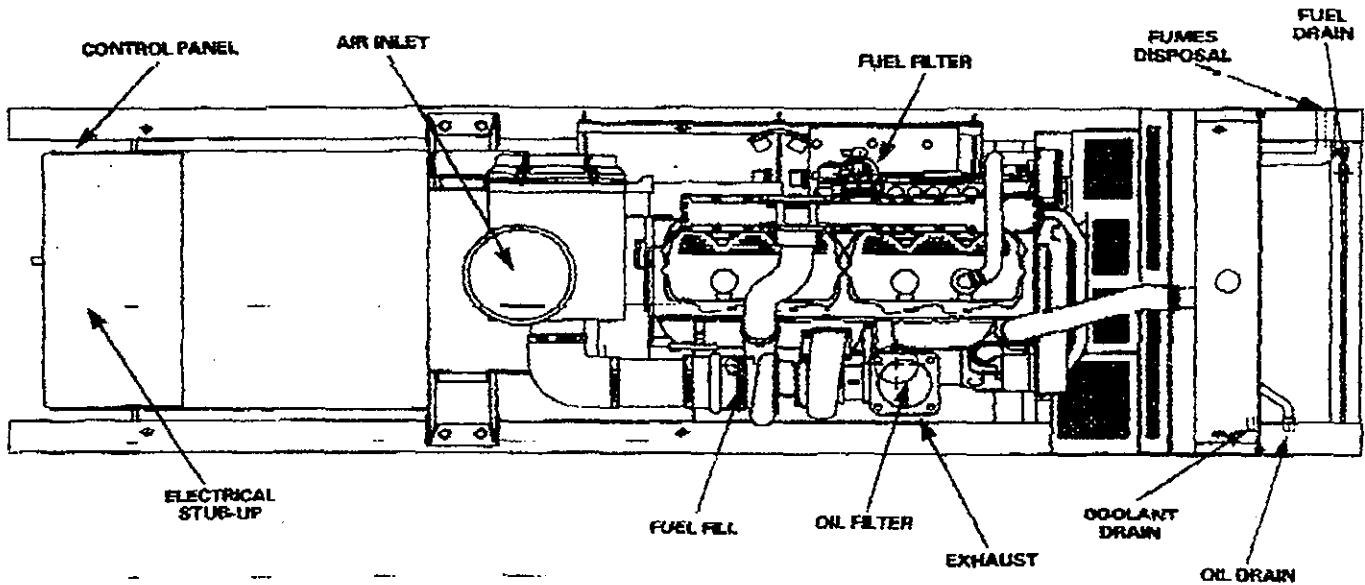
FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

SYSTEM	STANDARD	OPTIONAL
Air Inlet	modular air cleaner, single element with dust evacuator service indicator	dual element air cleaner heavy-duty air cleaner air inlet strut-off
Cooling	radiator with guard coolant drain line with valve fan and belt guards Caterpillar Extended Life Coolant	radiator duct flange jacket water heater with isolation valves low coolant level alarm and shutdown heat exchanger and expansion tank
Exhaust	stainless steel exhaust flex with mating weld flange industrial grade muffler	residential muffler critical muffler muffler mounting kit, through-wall installation kit engine exhaust guarding
Fuel	primary fuel filter secondary fuel filter fuel priming pump fuel pressure gauge flexible fuel lines	water separator manual transfer pump automatic transfer systems, 3 configurations low fuel level alarm and shutdown
Generator	self excited class F temperature rise 105° C (221° F) prime circuit breaker, IEC compliant 3-pole with shunt trip	permanent magnet excitation 2:1 Volts/Hz AVR Digital Voltage Regulator (D.V.R.) D.V.R. with KVAR/PF control space heater reactive droop kit oversize and premium generators circuit breaker, IEC compliant, 4-pole with shunt trip
Governor	hydra-mechanical	electronic isochronous and load sharing
Control panels	FMCP II	electromechanical auto start/stop panel switchgear conversion EMCP II+ system expansion modules
Lube	lubricating oil oil drain line with valves fumes disposal	manual sump pump
Mounting	formed steel base with integral fuel tank, 8 hour capacity - minimum linear vibration isolators between base and engine-generator	wide base with integral fuel tank extended capacity fuel tank base skid base
Starting/ charging	45 amp charging alternator Energize To Run (ETR) fuel shutoff solenoid 24 volt starting motor batteries with rack and cables	integral 5 amp battery charger oversize batteries ether starting aid battery disconnect
Other		enclosures - sound attenuated, weather protective automatic transfer switch CE certification

CATERPILLAR

365 kV·A GENERATOR SET

PRIME POWER GENERATOR SET PACKAGE — TOP VIEW



PACKAGE DIMENSIONS		
Length	mm	3800
Width	mm	1100
Height	mm	2100
Shipping Weight	kg	3631

Note: General configuration not to be used for installation. See general dimension drawings for detail.

RATING DEFINITIONS AND CONDITIONS

Prime Output available with varying load for an unlimited time. Prime power in accordance with ISO8578 10% overload power in accordance with ISO3046/1, AS2789, DIN6271, and DQ5514 available on request.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046/1, DIN6271, and DQ5514 standard conditions.

Fuel rates are based on fuel oil of 35° API (16° C or 60° F) gravity having an LHV of 42 780 kJ/kg (18 390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.).

Additional ratings may be available for specific customer requirements. Consult your Caterpillar representative for details.

Materials and specifications are subject to change without notice.
LEHX7032-01

Printed in U.S.A.

The International System of Units (SI) is used in this publication.

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**GOTHATUWA PUMP HOUSE
- PENSTOCK GATES**

PENSTOCKS

SELECTION

HAM BAKER™ SERIES 160-80

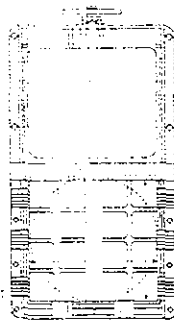
PHYSICAL DETAILS

Size range 150 to
1500 mm sq. or dia.
(Refer to both tables)

† On sizes 1500 mm and above, manual gearboxes or power operated units are normally supplied.

Dimensions cover Series 160-80. Details for Series 260-130 are available on request.

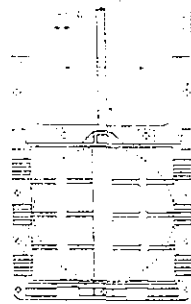
Full Frame



Thrust Direct

A	B	C	D	d	E	F	H	J	K	L	M
DIMENSIONS IN MILLIMETRES											
150	320	415	525	90	75	70	110	-	510	250	635
200	370	515	600	90	75	70	110	-	595	250	735
250	420	615	675	90	75	70	110	-	710	250	835
300	470	715	750	90	75	70	110	210	810	250	935
350	580	825	825	115	100	70	150	235	920	300	1045
400	630	925	900	115	100	70	160	235	1020	300	1145
450	680	1025	975	115	100	70	160	235	1120	300	1245
500	730	1145	1050	115	100	90	195	290	1240	400	1365
600	830	1340	1200	115	125	90	195	290	1440	400	1565
700	1020	1700	1550	160	125	135	265	395	1830	400	1935
750	1070	1800	1625	160	125	135	270	395	1930	400	2035
800	1120	1900	1700	160	125	135	270	395	2030	400	2135
900	1220	2100	1850	160	125	135	270	395	2230	500	2335
1000	1320	2300	2000	160	125	135	275	400	2430	500	2535
1100	1420	2500	2150	160	125	135	280	510	2630	500	2735
1200	1520	2700	2300	160	125	135	280	490	2830	500	2935
1300	1620	2900	2450	160	125	135	285	480	±	500	=
1400	1720	3100	2600	160	125	135	290	550	±	500	=
1500	1820	3300	2750	160	125	135	310	600	±	500	=

Open Top Frame



§ Centre fixing flange on sizes 1100 mm and above.

Thrust Remote - Rising Stem

A	N	R	S	T	U	V	W	Y	AA	AB	AC	AD	AE	AF	AG
DIMENSIONS IN MILLIMETRES															
150	280	45	275	160	-	-	-	-	6	45	100	M12	4	-	65
200	330	45	300	235	-	-	-	-	6	45	100	M12	4	-	65
250	380	45	375	260	-	-	-	-	6	60	125	M16	4	-	65
300	430	45	425	310	-	-	-	-	6	60	125	M16	4	-	65
350	510	65	240	320	260	-	-	-	8	60	125	M16	6	-	65
400	560	65	265	345	330	-	-	-	8	60	125	M16	6	-	65
450	610	65	290	365	385	-	-	-	8	60	125	M16	6	-	65
500	660	65	315	400	425	-	-	-	8	60	125	M16	6	-	65
600	760	65	365	450	325	-	-	-	8	60	125	M16	6	-	65
700	940	80	425	625	625	-	-	-	8	75	200	M24	6	-	65
750	990	80	450	650	650	-	-	-	8	75	200	M24	6	-	65
800	1040	80	480	700	700	-	-	-	8	75	200	M24	6	-	65
900	1140	80	700	600	600	-	-	-	8	75	200	M24	6	-	65
1000	1240§	80	750	750	750	-	-	-	8	75	200	M24	6	-	65
1100	1340§	80	810	810	810	-	600	1225	11	75	200	M24	9	190 sq	65
1200	1440§	100	900	900	900	-	600	1325	11	75	200	M24	9	190 sq	65
1300	1540§	100	400	650	900	900	650	1450	13	75	200	M24	11	190 sq	65
1400	1640§	100	700	500	900	900	650	1550	13	75	200	M24	11	190 sq	65
1500	1740§	100	700	600	900	900	750	1650	13	75	200	M24	11	190 sq	65

١١٩٢