

# ABS

# EQUIPMENT SPECIFICATION

DATE:	8/29/2008	SALES ORDER:	J0815
OWNER:	Wichita, Kansas	SERIAL NOS.:	
	Main 24, SWI Sewer to serve	REP:	Environmental & Process Systems, Inc.
	Edge Water Addition	ENGINEER:	Baughman Co. / City of Wichita
	Submersible Pump Station	CONTRACTOR:	Wildcat Construction Co. - Wichita, KS

## MECHANICAL DATA

QTY	2	MODEL	AFP0835(159)M80/2DEX-3"	IMPELLER	Vortex - 159 mm	
		SOLID SIZE DIA.	3"	DISCHARGE SIZE DIA.	3"	
QTY	1	POWER CABLE/PUMP	65 FT EA.	QTY	* CONTROL WIRES	--
	0.88	POWER CABLE DIAMETER, EACH			* INCLUDED IN POWER CABLE	

## MOTOR DATA

HP	10.7	RPM	3470	VOLT	460	PHASE	3	HZ	60
INSULATION CLASS	H			MOTOR FILLING MEDIUM	AIR				
THERMAL OVERLOAD	140 deg C + -5 deg C			SEAL PROTECTION	SEALMINDER				
FLA	13.1 @ 460/3/60			EXPLOSION PROOF RATING	Class 1, Div. 1 - C & D				

## HYDRAULIC DATA

ACTUAL FLOW	DETERMINE BY SYSTEM HEAD		DESIGN FLOW	100	GPM	93.8'	TDH
STATIC HEAD	19.6'		FUTURE FLOW		GPM		TDH
SHUT OFF HEAD	116'		HYDRAULIC EFFICIENCY	27.7%			
RUN OUT	245 GPM @ 60' / 375 GPM @ 28'		TEST REQUIREMENTS	FIELD START-UP			

## ACCESSORIES

QTY			PART NO.
2	BASE ASSEMBLY:	3" Guide Rail Base Assembly w/ 3" Elbow & SS Hardware.	62320649
2	REDUCER:	3" x 4" Eccentric Reducer & SS Hardware.	EPS
2	UPPER GUIDE RAIL BRACKET:	304 SS with Buna Isolation Bushing.	EPS
2	INTERMEDIATE BRACKET:	304 SS (2" Rail x 4" DI Discharge).	EPS
3	GUIDE RAIL:	2" x 20' 304 SS Schedule 40 (31.1' Deep Wetwell from Top).	PA
2	LIFTING ASSY.:	34' x 3/16" 304 SS Cable & 2' of 3/8" Chain & Pump Hardware.	EPS
0	ACCESS COVER:	Two Access Hatches & Frames Supplied By Others.	By Others.

## CONTROLS

1	CONTROL PANEL:	ABS Duplex Control Panel, UL, M80/2, 460/3/60.	EQ08119-Rev1
1	LEVEL CONTROLLER:	PAC2-XD with Suction Bell & 50' of 1/4" OD Tubing.	CSLC-1602-XD
3	FLOAT SWITCH:	High High, High & Low Level Alarm with 60' Cable.	SM60NO
1	FLOAT BRACKET:	316 SS Wall Bracket with Plastic Cord Grips.	WMS
2	KELLUM GRIP:	SS Kellum Grips for Pump Power Cable (0.87"-0.99")	024-01-015

## WARRANTY

2	PUMP/MOTOR:	5 Year Prorated.	ABS Std.
1	CONTROL PANEL:	1 Year.	ABS Std.

## PAINT

2	PUMP/MOTOR/BASE:	2 Part Epoxy.	ABS Std.
---	------------------	---------------	----------



140 Pond View Drive  
Meriden, Connecticut 06450-7156

Pump No. 1

PRODUCT: ABS SUBMERSIBLE PUMP  
PRODUCT START-UP REPORT  
Product Service Department  
Phone: (203) 238-2700

Customer: City of Wichita, Kansas

Job Site: Waters Edge Addition

Operator's Name:

Phone Number  
for Future Contact:

Model No. AFP0835(159)M80/2EX-3" (10.7 HP, 13.1 FLA @ 460/3/60)

Date of Start-Up \_\_\_\_\_ Date Shipped \_\_\_\_\_

S.O. No. \_\_\_\_\_ Pump S/N \_\_\_\_\_

Start-Up By: Representative \_\_\_\_\_ ABS \_\_\_\_\_ Other \_\_\_\_\_

Persons associated with job: \_\_\_\_\_ Present at start-up  
Name Yes No

Customer \_\_\_\_\_

Contractor \_\_\_\_\_

Consult. Eng. \_\_\_\_\_

Representative Environmental & Process Sys. \_\_\_\_\_

1. General condition of pump(s) at start-up

Pump(s) were stored \_\_\_\_\_ months - Indoors \_\_\_\_\_ Outdoors \_\_\_\_\_  
Were Pump Cable ends properly protected? Yes \_\_\_\_\_ No \_\_\_\_\_  
If not, explain \_\_\_\_\_

2. Check for proper Installation of:

Upper guide rail bracket(s) bolted securely   
Guide rail(s) mounted plumb   
Slide rail base(s) properly bolted down

3. Installation of float switches: PAC II Controller & Floats

Float switches are hanging free   
Fixed to rail  or Pipe   
On cable fixed to pipe or rail, free length set @ \_\_\_\_\_  
Check to insure that influent flow will not tangle floats:

Float switch location: Duplex  
Pump off \_\_\_\_\_ in. above top of pump  
Pump on \_\_\_\_\_ ft. above off level  
Lag pump on \_\_\_\_\_ ft. above on level  
High Level Alarm \_\_\_\_\_ ft. above lag pump "on level"

4. Float switch tested per instructions in manual

5. Control Panel: (By ABS)

General condition at start-up \_\_\_\_\_  
Manufacturer's identification No. \_\_\_\_\_  
How is it mounted? \_\_\_\_\_  
Approximate distance from pump \_\_\_\_\_  
Is there a junction box in pit? \_\_\_\_\_ Where? \_\_\_\_\_  
Does panel include water sensing relay? \_\_\_\_\_

6. Electrically connect the pump leads, float switches and power supply leads per instructions located in the control panel door

7. Initial Pump Start-Up:

Pump rotation check: Stand pump on hard surface, jog starting switch, pump to react. "Twist" in direction of arrow on top of pump.

460/3/60

Pump:	ON	OFF	ON	OFF
T1-T2	v. _____	v. _____	T1-G. _____	v. _____
T1-T3	v. _____	v. _____	T2-G. _____	v. _____
T2-T3	v. _____	v. _____	T3-G. _____	v. _____

8. Check for current balance - pump on hard surface:

T1 = \_\_\_\_\_ amps  
T2 = \_\_\_\_\_ amps  
T3 = \_\_\_\_\_ amps

Note: Calculate for current unbalance. (See "Initial Start-up" section of I.O.M. manual.) If unbalance is greater than 4%, consult factory immediately.

9. Install pump in pit - **WARNING: Do not use pump electrical cables to lower pump.**

10. Pump is compressing gasket against the mating flange.

If water is available check for current balance:

T1 \_\_\_\_\_ amps T2 \_\_\_\_\_ amps T3 \_\_\_\_\_ amps

11. Equipment difficulties during start-up

IF ADDITIONAL PARTS ARE REQUIRED - PLEASE CONTACT THE ABS PRODUCT SERVICE DEPARTMENT.

Started by: \_\_\_\_\_ ABS Approval: \_\_\_\_\_

Firm: Environmental & Process Systems, Inc. \_\_\_\_\_

Date: \_\_\_\_\_

The equipment has been inspected and is ready for permanent operation.

Customer: \_\_\_\_\_ Date: \_\_\_\_\_

Customer Approval: \_\_\_\_\_ Date: \_\_\_\_\_

This report to be sent to:

ABS Pumps Inc.  
140 Pond View Drive  
Meriden, Connecticut 06450

Attention: Product Service Department



140 Pond View Drive  
Meriden, Connecticut 06450-7156

Pump No. 2

PRODUCT: ABS SUBMERSIBLE PUMP  
PRODUCT START-UP REPORT  
Product Service Department  
Phone: (203) 238-2700

Customer: City of Wichita, Kansas

Job Site: Waters Edge Addition

Operator's Name:

Phone Number  
for Future Contact:

Model No. AFP0835(159)M80/2EX-3" (10.7 HP, 13.1 FLA @ 460/3/60)

Date of Start-Up \_\_\_\_\_ Date Shipped \_\_\_\_\_

S.O. No. \_\_\_\_\_ Pump S/N \_\_\_\_\_

Start-Up By: Representative \_\_\_\_\_ ABS \_\_\_\_\_ Other \_\_\_\_\_

Persons associated with job: \_\_\_\_\_ Present at start-up  
Name Yes No

Customer \_\_\_\_\_

Contractor \_\_\_\_\_

Consult. Eng. \_\_\_\_\_

Representative Environmental & Process Sys. \_\_\_\_\_

1. General condition of pump(s) at start-up

Pump(s) were stored \_\_\_\_\_ months - Indoors \_\_\_\_\_ Outdoors \_\_\_\_\_

Were Pump Cable ends properly protected? Yes \_\_\_\_\_ No \_\_\_\_\_

If not, explain \_\_\_\_\_

2. Check for proper Installation of:

Upper guide rail bracket(s) bolted securely

Guide rail(s) mounted plumb

Slide rail base(s) properly bolted down

3. Installation of float switches: PAC II Controller & Floats

Float switches are hanging free

Fixed to rail  or Pipe

On cable fixed to pipe or rail, free length set @ \_\_\_\_\_

Check to insure that influent flow will not tangle floats.

Float switch location: Duplex

Pump off \_\_\_\_\_ in. above top of pump

Pump on \_\_\_\_\_ ft. above off level

Lag pump on \_\_\_\_\_ ft. above on level

High Level Alarm \_\_\_\_\_ ft. above lag pump "on level"

4. Float switch tested per instructions in manual

5. Control Panel: (By ABS)

General condition at start-up \_\_\_\_\_

Manufacturer's identification No. \_\_\_\_\_

How is it mounted? \_\_\_\_\_

Approximate distance from pump \_\_\_\_\_

Is there a junction box in pit? \_\_\_\_\_ Where? \_\_\_\_\_

Does panel include water sensing relay? \_\_\_\_\_

6. Electrically connect the pump leads, float switches and power supply leads per instructions located in the control panel door

7. Initial Pump Start-Up:

Pump rotation check: Stand pump on hard surface, jog starting

switch, pump to react. "Twist" in direction of arrow on

top of pump.

460/3/60

Pump: ON OFF ON OFF

T1-T2 \_\_\_\_\_ v. \_\_\_\_\_ v. T1-G \_\_\_\_\_ v. \_\_\_\_\_ v.

T1-T3 \_\_\_\_\_ v. \_\_\_\_\_ v. T2-G \_\_\_\_\_ v. \_\_\_\_\_ v.

T2-T3 \_\_\_\_\_ v. \_\_\_\_\_ v. T3-G \_\_\_\_\_ v. \_\_\_\_\_ v.

8. Check for current balance - pump on hard surface:

T1 = \_\_\_\_\_ amps

T2 = \_\_\_\_\_ amps

T3 = \_\_\_\_\_ amps

Note: Calculate for current unbalance. (See "Initial Start-up" section of I.O.M. manual.) If unbalance is greater than 4%, consult factory immediately.

9. Install pump in pit - **WARNING:** Do not use pump electrical cables to lower pump.

10. Pump is compressing gasket against the mating flange.

If water is available check for current balance:

T1 \_\_\_\_\_ amps T2 \_\_\_\_\_ amps T3 \_\_\_\_\_ amps

11. Equipment difficulties during start-up

IF ADDITIONAL PARTS ARE REQUIRED - PLEASE CONTACT THE ABS PRODUCT SERVICE DEPARTMENT.

Started by: \_\_\_\_\_ ABS Approval: \_\_\_\_\_

Firm: Environmental & Process Systems, Inc.

Date: \_\_\_\_\_

The equipment has been inspected and is ready for permanent operation.

Customer: \_\_\_\_\_ Date: \_\_\_\_\_

Customer Approval: \_\_\_\_\_ Date: \_\_\_\_\_

This report to be sent to:

ABS Pumps Inc.  
140 Pond View Drive  
Meriden, Connecticut 06450

Attention: Product Service Department

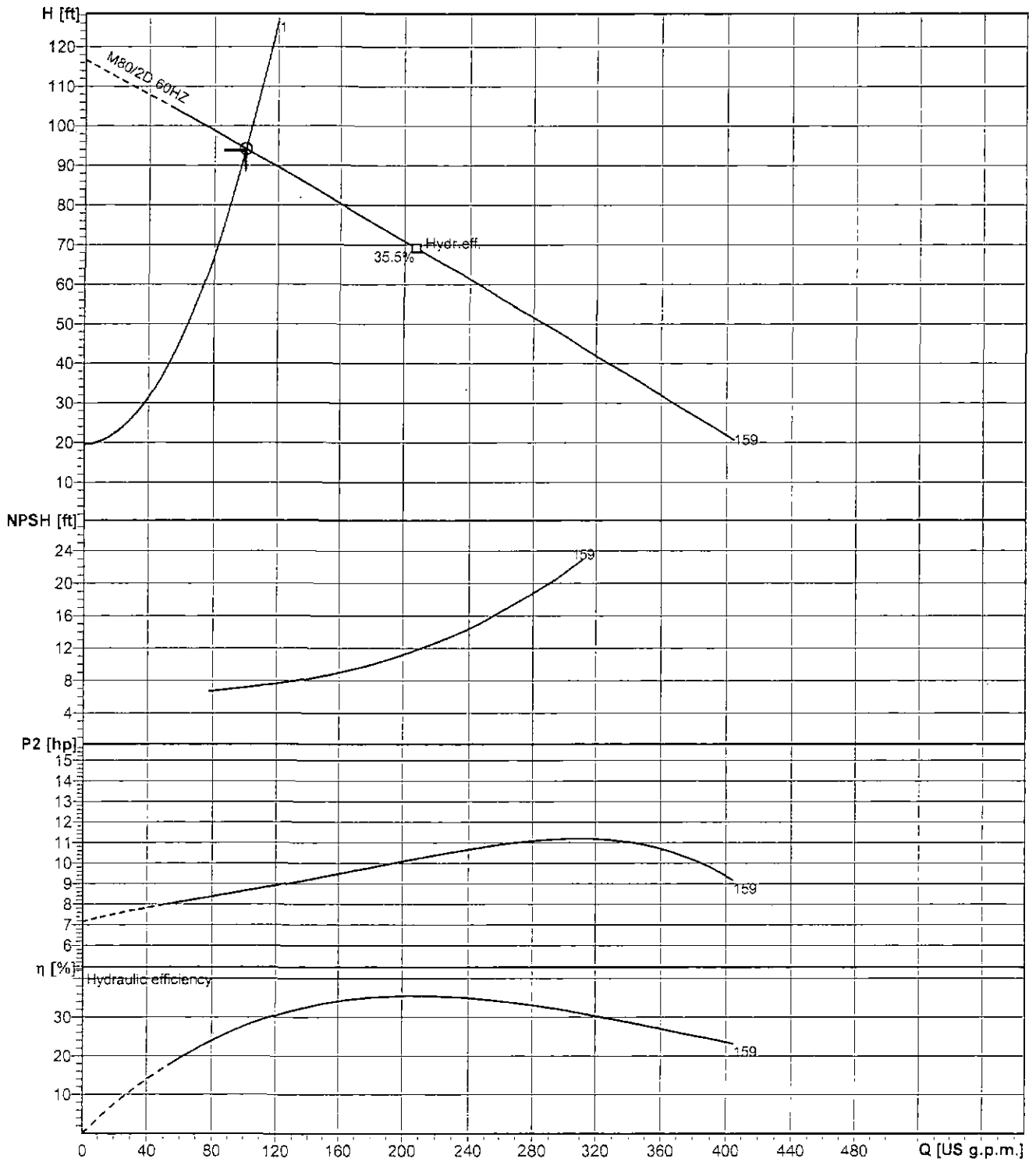


# Pump performance curves AFP 0835 60 HZ

Curve number

Reference curve  
AFP 0835

Wichita, Kansas - Edge Water Addition			Discharge DN80	Frequency 60 Hz
Density 62.43 lb/ft <sup>3</sup>	Viscosity 0.0000169 ft <sup>2</sup> /s	Testnorm Hydraulic Institute	Rated speed 3470 rpm	Date 2008-09-02
Flow 100 US g.p.m.	Head 94.2 ft	Rated power 8.65 hp	Hydraulic efficiency 27.7 %	NPSH 7.2 ft



Impeller size 6.24 inch	N° of vanes 4	Impeller Vortex impeller	Solid size 2 1/2"	Revision 2006-04-25
----------------------------	------------------	-----------------------------	----------------------	------------------------

ABS reserves the right to change any data and dimensions without prior notice and can not be held responsible for the use of information contained in this software.

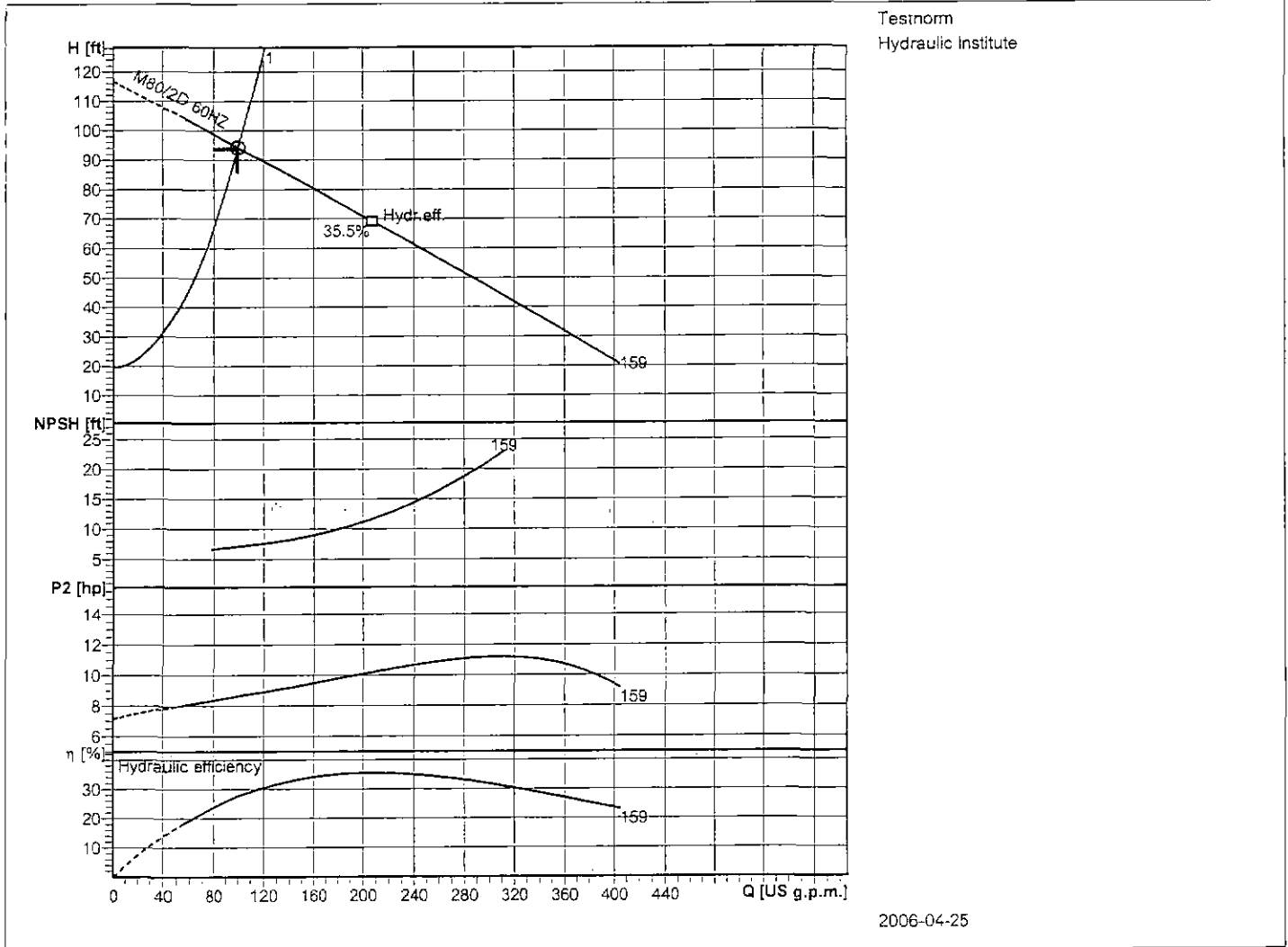
ABSEL PRO 1.7.2 / 2007-07



# AFP 0835 60 HZ

Wichita, Kansas - Edge Water Addition

Testnorm  
Hydraulic Institute



2006-04-25

<b>Operating data specification</b>		Flow	100 US g.p.m.	Head	94.2 ft
		Static head	19.6 ft	Efficiency	27.7 %
		Shaft power	8.65 hp	NPSH	7.2 ft
		Fluid	Wastewater	Temperature	39 °F
		Nature of system	Single head pump	No. of pumps	1
<b>Pump data</b>		Type	AFP 0835 60 HZ	Make	ABS
		Series	AFP M1-ME3 (1kW-22kW)	Impeller	Vortex impeller
		N° of vanes	4	Impeller size	6.24 inch
		Free passage	2 1/2"	Suction port	DN80
		Discharge port	DN80		
<b>Motor data</b>		Rated voltage	460 V	Frequency	60 Hz
		Rated power P2	10.7 hp	Nominal speed	3470 rpm
		Number of poles	2	Efficiency	85.2 %
		Power factor	0.897	Rated current	13.1 A
		Starting current	80.9 A	Rated torque	16.2 lbf ft
		Degree of protection	IP68	Insulation class	F

**STANDARD & EXPLOSION PROOF**

Motor Model	BHP Out (P2)	KW In (P1)	Nom RPM	Rated Voltage	Full Load Amps	Locked Rotor Amps	NEMA Code	S.F.	Power Factor at % Load			Motor Efficiency at % Load		
									100%	75%	50%	100%	75%	50%
<b>M2 Frame, Three Phase, 2 Pole</b>														
M80/2	10.7	9.4	3450	208	29.0	179	N	1.1	.90	.87	.81	85.2	85.8	83.5
				230	26.2	162								
				460	13.1	80.9								
				575	10.5	64.7								
M100/2	13.4	12.6	3450	208	37.6	338	L	1.15	.87	.82	.72	84.9	86.3	84.6
				230	34.0	306								
				460	17.0	153								
				575	13.6	122								
M125/2	16.8	14.5	3450	208	47.1	338	J	1.1	.85	.84	.79	86.4	85.8	82.9
				230	42.6	306								
				460	21.3	153								
				575	17.0	122								
<b>ME3 Frame, Three Phase, 2 Pole</b>														
ME185/2	25	20.4	3550	230	60	428	H	1.15	.85	.80	.71	91	90.8	88.8
				460	30	214								
				575	24	171								
ME200/2	27	22	3550	230	64.4	428	H	1.15	.86	.81	.73	91	91	89.3
				460	32.2	214								
				575	25.8	171								
ME230/2	31	25.5	3550	230	73.6	428	F	1.15	.87	.84	.76	.90	.91	.90
				460	36.8	214								
				575	29.4	171								

Specifications subject to change without notice

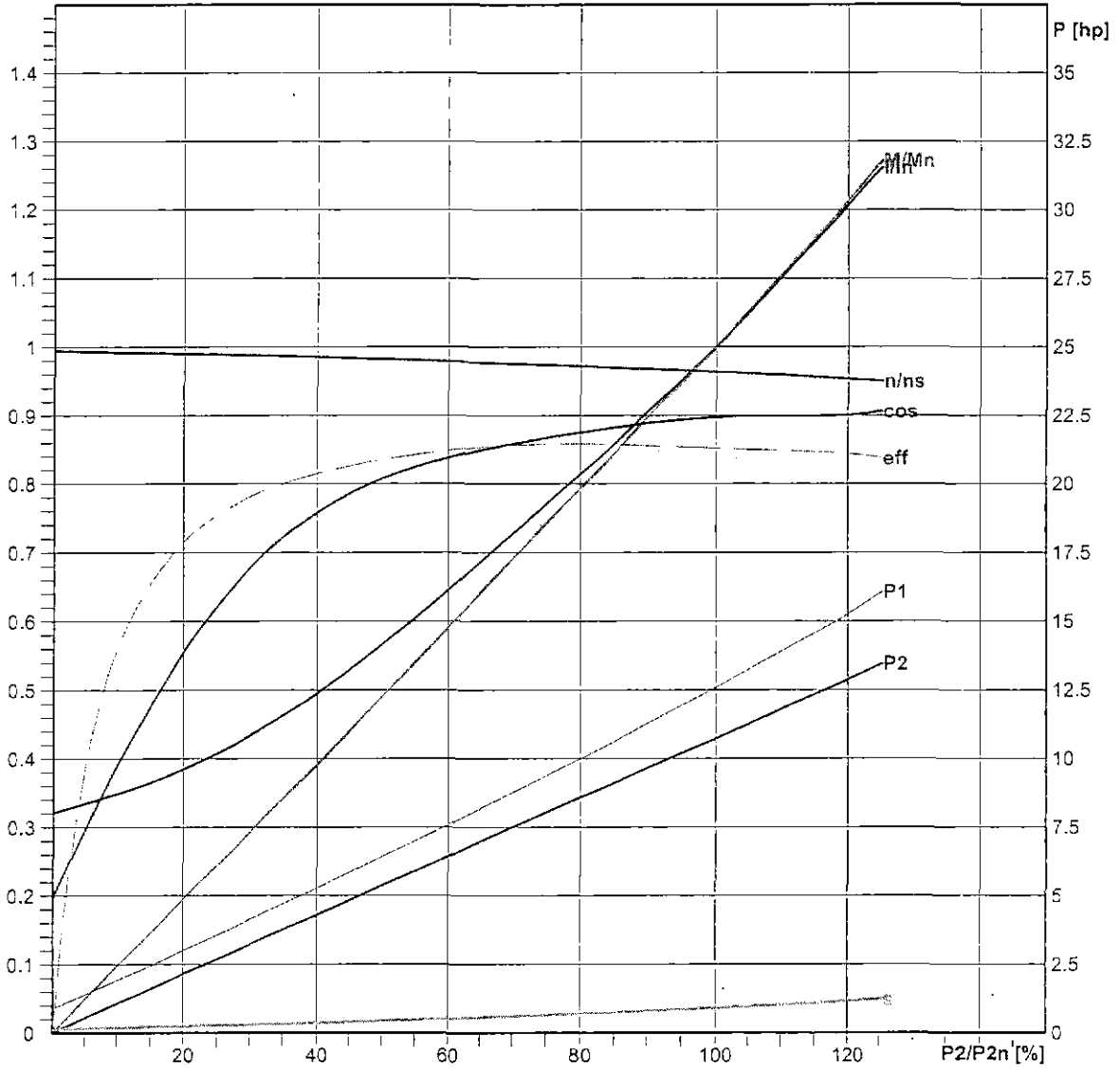


# Motor performance curve M80/2D 60HZ

Frequency  
60 Hz

Wichita, Kansas - Edge Water Addition

Rated power 10.7 hp	Service factor	Nominal speed 3470 rpm	Number of poles 2	Rated voltage 460 V	Date 2008-09-02
------------------------	----------------	---------------------------	----------------------	------------------------	--------------------



Loading	No load	25 %	50 %	75 %	100 %	125 %
P1 [hp]	0.8902	3.557	6.422	9.377	12.59	16
P2 [hp]	0	2.682	5.364	8.046	10.73	13.41
I [A]	4.214	5.355	7.443	10.12	13.14	16.52
eff [%]	0	75.41	83.53	85.81	85.21	83.84
cos	0.1977	0.6216	0.8076	0.8673	0.8971	0.906
n [rpm]	3581	3561	3537	3506	3470	3421
M [lbf ft]	0	3.956	7.965	12.05	16.24	20.59
s [%]	0.5165	1.078	1.739	2.615	3.621	4.959

Tolerance according to VDE 0530 T1 12.84 for rated power

Starting current 80.9 A	Starting torque	Moment of inertia 0.192 lb ft <sup>2</sup>
----------------------------	-----------------	---



Massblatt AFP 0835 Nassinstallation  
 Dimension sheet WET-WELL Installation  
 Dimensioni Installazione sommersa  
 Hoja de dimensiones instalación sumergida  
 Plan d'encombrement installation noyée

No: AN-M.22.399-00  
 Drawn: DW  
 Issue Date: 11.08.05  
 Änderungen vorbehalten  
 Technical changes reserved  
 Con riserva di modifiche  
 Con reserva de modificaciones  
 Sous réserve de modification

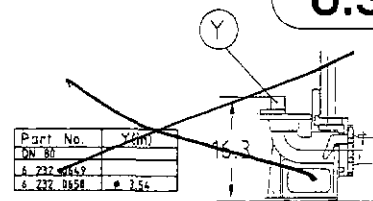
**50 Hz**

**60 Hz**

**U.S.**

Typ Type Tipo	Gewicht Weight Poids Peso (lb)	H (")
M 58/2	286	26.2
M 70/2	286	26.2
M 110/2	313	28.2

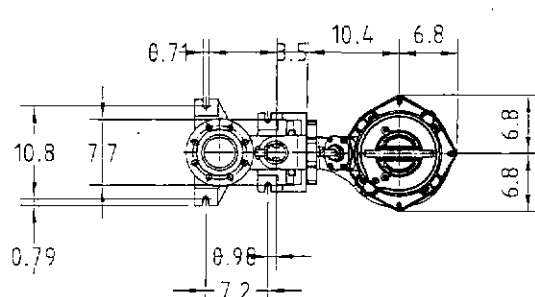
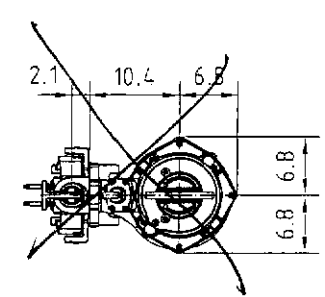
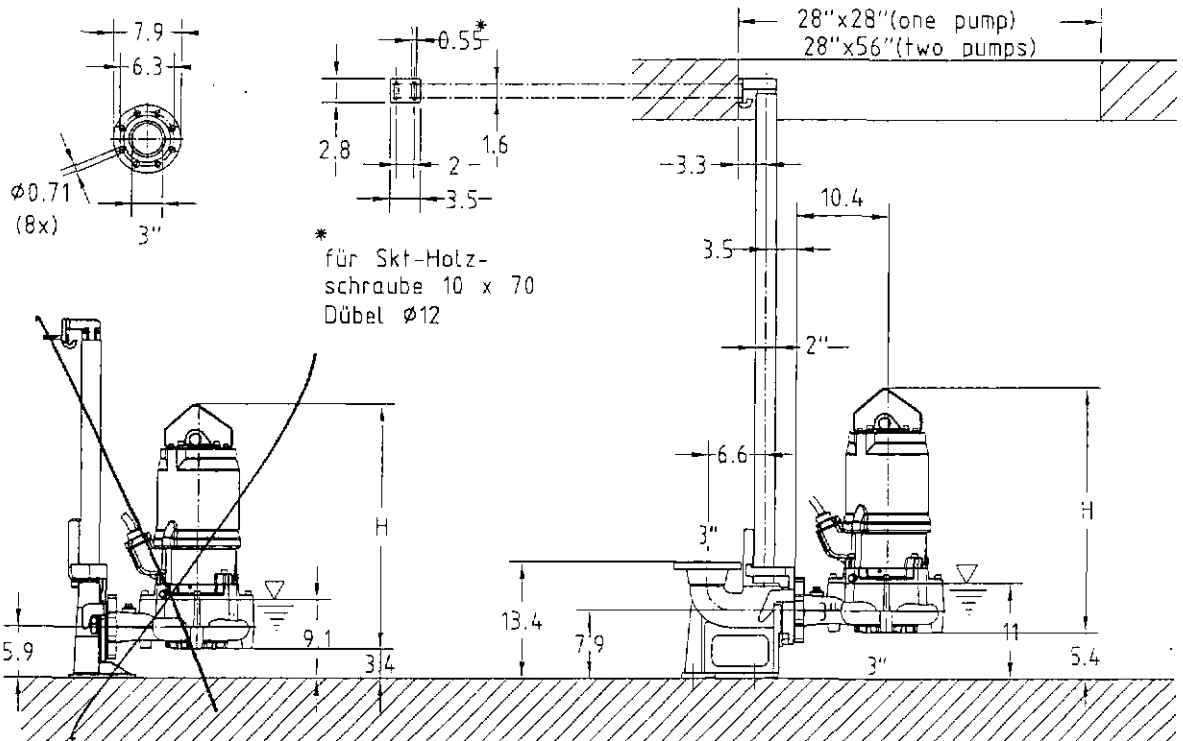
Typ Type Tipo	Gewicht Weight Poids Peso (lb)	H (")
M 80/2	286	26.2
M 125/2	313	28.2



Part No.	Y (mm)
DW 80	
6 232 00659	
6 232 00658	* 3.54

Spannverhältnis  
 Ligne con.

min. Schachtöffnung  
 min. Shaft opening  
 Dimensioni min. scatola  
 min. apertura del pazo  
 Largeur min. du puzoz



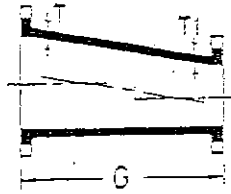
Gewicht: Beinhaltet Pumpe und Halterung  
 Weight: includes pump and slider bracket  
 Il peso include il pezzo intermedio  
 Peso: incluye bomba y uña  
 Poids: Pompe et coulisseau

Guss-Allgemeintoleranzen nach DIN1680 - GTB16  
 General tolerances for castings in acc. to DIN1680-GTB16  
 Tolleranze generali delle fusioni secondo DIN1680-GTB16  
 Tolerancias generales para la fundición seg. de DIN1680-GTB16  
 Tolérance générale de la fonderie selon DIN1680-GTB16

# CAST IRON FLANGED FITTINGS

ANSI B16.1 Standard

## ECCENTRIC REDUCERS



F-1894 Eccentric Reducer

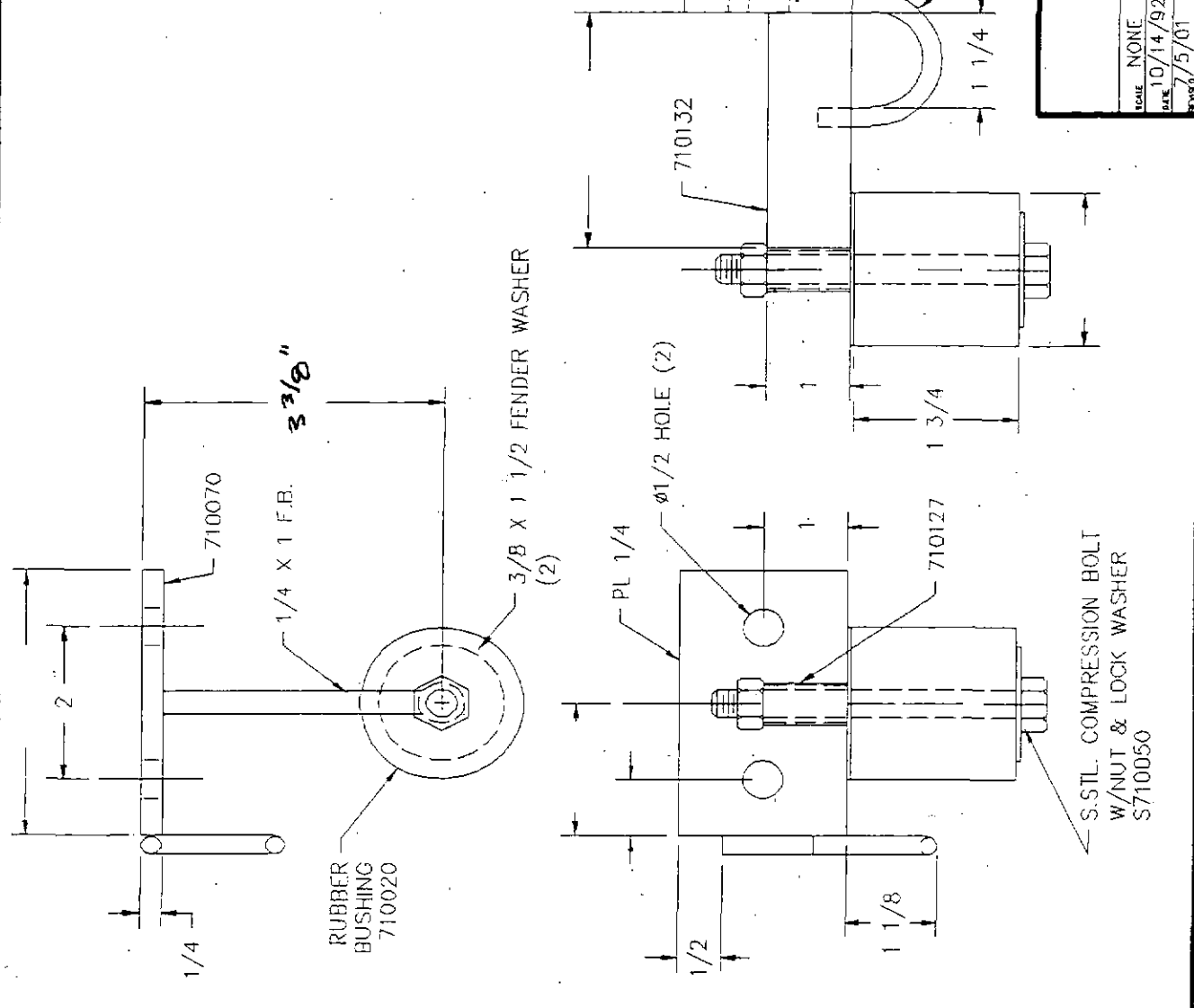
Furnished Faced and Drilled  
to 125 Pound Template

For Concentric Reducers  
See Page 80

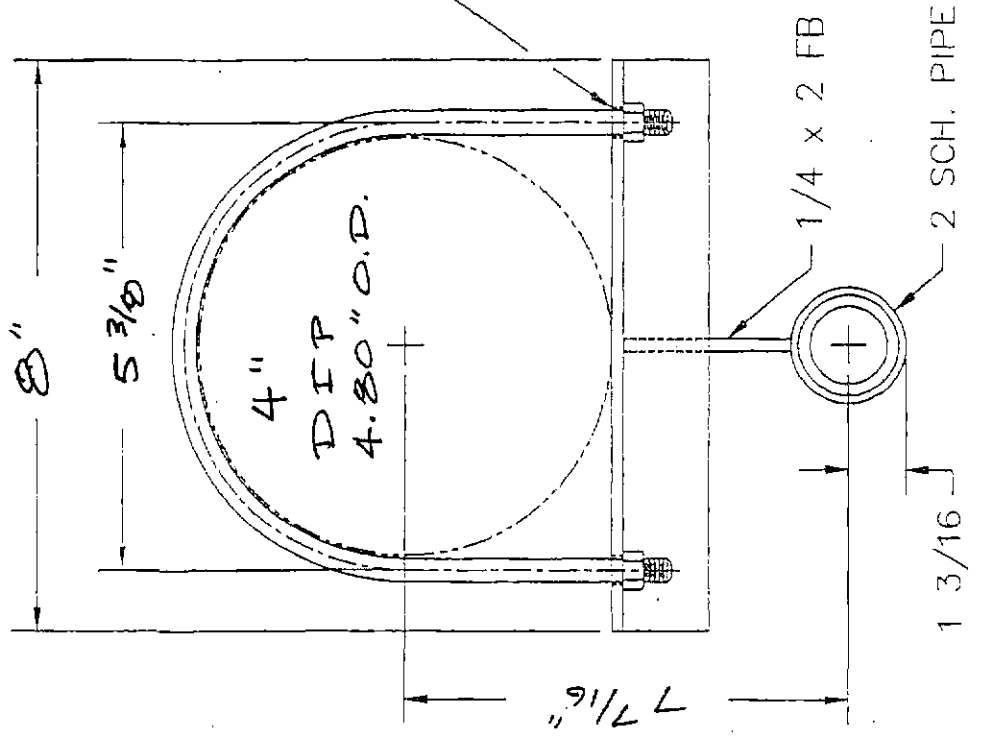
### DIMENSIONS AND WEIGHTS

Nominal Pipe Size Inches	Dimensions—Inches			Approximate Weight Pounds
	T	T <sub>1</sub>	G	
(2) → 4 x 3	1/2	3/8	7.00	28
6 x 3	9/16	3/8	9.00	39
6 x 4	9/16	1/2	9.00	47
8 x 4	5/8	1/2	11.00	66
8 x 6	5/8	9/16	11.00	77
10 x 4	3/4	1/2	12.00	95
10 x 6	3/4	9/16	12.00	100
10 x 8	3/4	5/8	12.00	120
12 x 6	13/16	9/16	14.00	140
12 x 8	13/16	5/8	14.00	155
12 x 10	13/16	3/4	14.00	180
14 x 6	7/8	9/16	16.00	180
14 x 8	7/8	5/8	16.00	200
14 x 10	7/8	3/4	16.00	220
14 x 12	7/8	13/16	16.00	250
16 x 6	1	9/16	18.00	230
16 x 8	1	5/8	18.00	250
16 x 10	1	3/4	18.00	280
16 x 12	1	13/16	18.00	310
16 x 14	1	7/8	18.00	340
18 x 8	1 1/16	5/8	19.00	300
18 x 10	1 1/16	3/4	19.00	320
18 x 12	1 1/16	13/16	19.00	350
18 x 14	1 1/16	7/8	19.00	380
18 x 16	1 1/16	1	19.00	430
20 x 10	1 1/8	3/4	20.00	380
20 x 12	1 1/8	13/16	20.00	410
20 x 14	1 1/8	7/8	20.00	450
20 x 16	1 1/8	1	20.00	490
20 x 18	1 1/8	1 1/16	20.00	520
24 x 12	1 1/4	13/16	24.00	580
24 x 14	1 1/4	7/8	24.00	620
24 x 16	1 1/4	1	24.00	670
24 x 18	1 1/4	1 1/16	24.00	700
24 x 20	1 1/4	1 1/8	24.00	760

QTY.	NUMBER	DESCRIPTION	LENGTH
1	710070	1/4 X 2 F.B.	4 1/2
1	710132	1/4 X 1 F.B.	
1	710127	Ø9/16 X 16 GA. WALL	1
1	64445-304	3/8-16 X 3 1/2 BOLT	
1	66640-304	3/8Ø NUT	
1	67560-304	3/8Ø LOCK WASHER (NS)	
1	710020	2Ø R.B.	1 3/4
2	67363-316	3/8 X 1 1/2 FEN. WASHER	
1	710005	1/4Ø ROD	5



SCALE	NONE	REVISED	DATE	10/14/92	APPROVED BY	STANDARD
DATE	7/5/01	MATERIAL	STAINLESS STEEL	304L	ABS	U4ALEAAA



NOTE:

MATERIAL: 304 STAINLESS STEEL

INTERMEDIATE GUIDE BRACKET  
FOR 2 SINGLE RAIL

DRAWN BY: AJA	SCALE: 1/4=1	QUOTED	DATE: 04/17/01
CHECK BY: [Signature]	DWG. NO: 26353	SHEET 1	OF 1

# GUIDE RAILS



## STAINLESS PIPE

**Cold Drawn, Annealed and Pickled**

~~Seamless or Welded~~

- Type 304 Identification color: green.  
Specs.: MIL-P-1144, ASTM-A312, ASTM-A376.
  - Type 316 Identification color: purple.  
Specs.: MIL-P-1144, ASTM-A312, ASTM-A376.
- Random Lengths: 20

Iron Pipe Size in Inches	Wt. per Ft. in Lbs.	Diameter in Inches		Wall Thick., Inches	Type 304 UNS S30400		Type 316 UNS S31600	
		O.D.	I.D.		S	W	S	W
		<b>Schedule 5—Light Wall Iron Pipe Sizes</b>						
3/4	.684	1.050	.920	.065		X		
1	.868	1.315	1.185	.065		X		
1 1/4	1.107	1.660	1.530	.065		X		
1 1/2	1.274	1.900	1.770	.065		X		
2	1.604	2.375	2.245	.065		X		
2 1/2	2.475	2.875	2.709	.083		X		
3	3.029	3.500	3.334	.083		X		
3 1/2	3.472	4.000	3.834	.083		X		
4	3.915	4.500	4.334	.083		X		
<b>Schedule 10—Light Wall Iron Pipe Sizes</b>								
3/4	.8572	1.050	.884	.083		X		
1	1.404	1.315	1.097	.109		X		
1 1/4	1.806	1.660	1.442	.109		X		
1 1/2	2.085	1.900	1.682	.109		X		
2	2.638	2.375	2.157	.109		X		
2 1/2	3.531	2.875	2.635	.120		X		
3	4.332	3.500	3.260	.120		X		
3 1/2	4.973	4.000	3.760	.120		X		
4	5.613	4.500	4.260	.120		X		
<b>Schedule 40—Standard Iron Pipe Sizes</b>								
1/8	.2447	.405	.269	.068		X		
1/4	.4248	.540	.364	.088	X	X	X	X
3/8	.5676	.675	.493	.091	X	X	X	X
1/2	.8510	.840	.622	.109	X	X	X	X
3/4	1.131	1.050	.824	.113	X	X	X	X
1	1.679	1.315	1.049	.133		X		X
1 1/4	2.273	1.660	1.380	.140		X		X
1 1/2	2.718	1.900	1.610	.145		X		X
2	3.653	2.375	2.067	.154		X		X
2 1/2	5.793	2.875	2.469	.203		X		X
3	7.576	3.500	3.068	.216		X		X
3 1/2	9.109	4.000	3.548	.226		X		X
4	10.79	4.500	4.026	.237		X		X
5	14.92	5.563	5.047	.258	X	X	X	X
6	18.97	6.625	6.065	.280	X	X	X	X

S=Seamless. W=Welded.  
Other stainless pipe types and sizes are quickly available—  
also all standard size fittings and valves. Send us your  
requirements.

## STAINLESS CHAIN WELDED LINK

QUANTITY 2 2' FEET EACH

STOCK NO.	THICKNESS	INSIDE LG.	INSIDE WIDTH	S.W.L	PROOF TEST	ULTIMATE B/S	LINKS FT.	WT/FT 100
2-A	.079	.433	.157	66	132	265	26	5
3-B	.118	.945	.197	220	440	880	16	10
5-B	.197	1.06	.275	550	1100	2200	11	29
1/8	.158	.89	.29	410	826	1650	13	22
3/16	.217	.95	.41	830	1800	3750	12	42
1/4	.280	1.00	.50	1450	3000	6060	12	74
5/16	.335	1.10	.50	2200	4600	9260	10	105
3/8	.394	1.23	.63	3000	6500	13,200	9	150
1/2	.512	1.50	.81	4600	10,000	22,000	8	255
5/8	.623	1.87	1.00	6900	13,800	28,700	6	395
3/4	.750	2.12	1.12	9750	19,500	39,700	5	555

\*\*\*\*\*

### SCREW PIN ANCHOR SHACKLES

Quantity 2

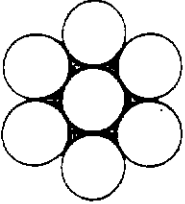
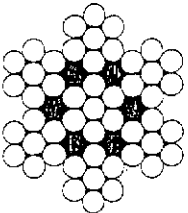
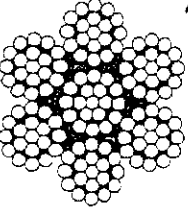
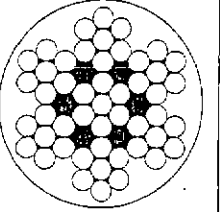
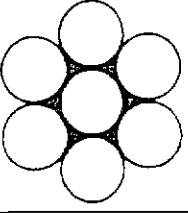
SIZE	PIN DIA.	SWL LBS.
1/4	5/16	1000
5/16	3/8	1500
3/8	7/16	2000
7/16	1/2	3000
1/2	5/8	4000
5/8	3/4	6000
3/4	7/8	8500
1	1/8	16000

### QUICK LINKS

Quantity 0

WIRE DIA.	OVERALL LENGTH	JAW OPENING	LOAD LBS
1/8	1-3/8	3/16	220
3/16	1-7/8	1/4	330
1/4	2-1/4	9/32	660
5/16	3	3/8	1100
3/8	3-1/8	7/16	1760

# Aircraft Cable

	Size (ins.)	Approx. Breaking Strength (lbs.)	Approx. Wt./1,000 Ft. (lbs.)
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;"> <b>1 x 7 Preformed</b>   </div> <div style="margin-bottom: 10px;"> <b>7 x 7 Preformed</b>   </div> <div style="margin-bottom: 10px;"> <b>7 x 19 Preformed</b>   </div> <div style="margin-bottom: 10px;"> <b>Vinyl Coated Galvanized Aircraft Cable</b>   </div> <div> <b>Guy Strand EHS Grade Class A Galvanized</b>   </div> </div>	<b>Galvanized Aircraft Cable</b> 1 x 7 Preformed 1/16 7 x 7 Preformed 1/16 3/32 1/8 5/32 3/16 1/4 7 x 19 Preformed 3/32 1/8 5/32 3/16 7/32 1/4 5/16 3/8	500 480 920 1,700 2,600 3,700 6,100 1,050 2,000 2,800 4,200 5,600 7,000 9,800 14,400	8 8 16 28 46 64 106 16 29 45 65 86 110 173 243
	<b>Stainless Aircraft Cable</b> 1 x 7 Preformed 1/16 7 x 7 Preformed 1/16 3/32 1/8 7 x 19 Preformed 1/8 5/32 3/16 1/4 5/16 3/8	480 480 920 1,700 1,700 2,400 3,700 6,400 9,000 12,000	8 8 16 28 29 45 65 110 173 243
	<b>Vinyl Coated Galvanized Aircraft Cable</b> 1/16 - 3/32 7 x 7 3/32 - 3/16 7 x 7 1/8 - 3/16 7 x 7 3/16 - 1/4 7 x 19 1/4 - 5/16 7 x 19	480 920 1,700 4,200 7,000	12 28 44 88 150

## Aircraft Cable

- Reels: 500 ft.  
1,000 ft.  
5,000 ft.  
Custom lengths available on request.

- Aircraft Cable: Galvanized  
Stainless Steel  
Vinyl Coated

Instructions: 1 x 7  
7 x 7  
7 x 19

HS Guy Strand.

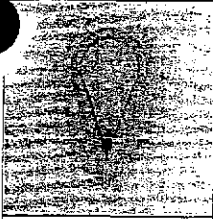
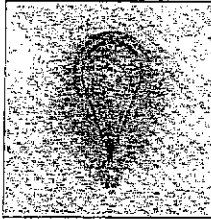
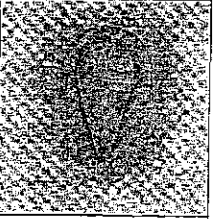
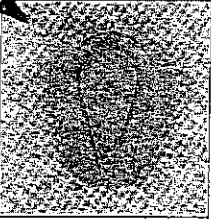
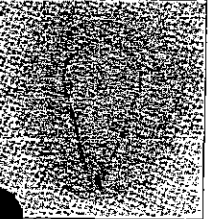
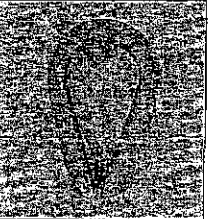
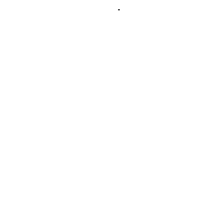



Certificates available on request.

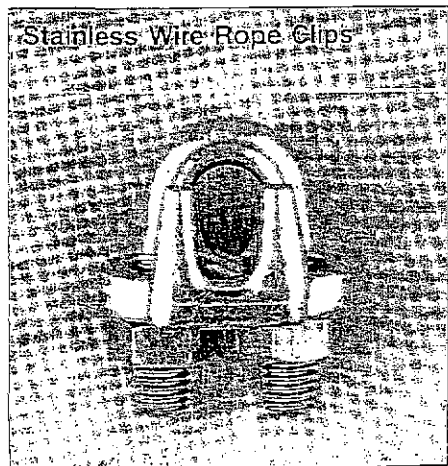
QTT - 34' PER PUMP

TOTAL

# Thimbles

QTY - PER PUMP  
TOTAL

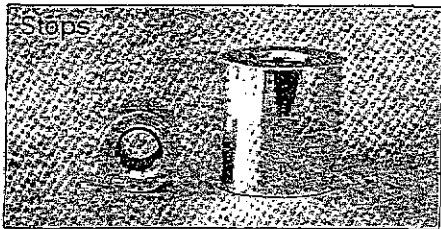
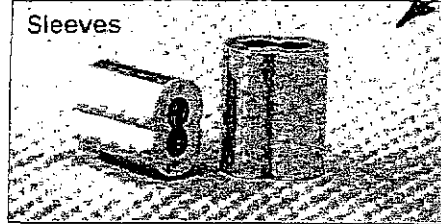
		Cable Size (ins.)	Wt./100 Pieces Galvanized (lbs.)	Wt./100 Pieces Stainless Steel (lbs.)
 Galvanized	 Stainless	AN-type Thimbles	1/16	.15
			3/32, 1/8	.43
 Galvanized	 Stainless	• Electro-Galvanized	5/32	.60
		• Stainless Steel	3/16	.98
 Galvanized	 Stainless		1/4	1.50
			5/16	3.50
 Galvanized	 Stainless		3/8	8.50
		Standard Wire Rope Thimbles	1/8	3.5
			3/16	3.5
			1/4	3.5
		• Hot Galvanized	5/16	4.0
			3/8	7.5
		• Stainless Steel	1/2	14.0
			5/8	36.0
			3/4	50.0
			7/8	90.0
	1	104.0		
 Galvanized	 Stainless	Heavy Duty Wire Rope Thimbles	1/4	8.0
			5/16	14.0
			3/8	25.0
		• Hot Galvanized	1/2	51.0
			9/16	51.0
		• Stainless Steel	5/8	75.0
			3/4	147.0
			7/8	185.0
			1	300.0



Stainless Wire Rope Clips			
Rope Size			Wt./100 pcs (lbs.)
inches	mm		
1/16	2		1.7
3/32 - 1/8	4		4.1
3/16	6		7.7
1/4	8		17.2
5/16 - 3/8	10		35.2
1/2 - 9/16	14		59.6
5/8	18		100.0
3/4	20		150.0

QTY, - PER PUMP  
TOTAL

# Swage Fittings



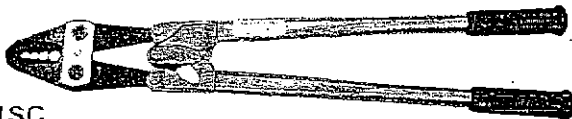
	Cable Size (ins.)	Wt./1,000 Pieces (lbs.)	
		Aluminum	Copper / S.S.
Sleeves	1/16	1.0	2.7
	3/32	3.2	6.8
	1/8	6.6	17.2
	1/8, 3/16	5.2	—
	5/32	8.0	23.0
	3/16	15.2	52.0
	1/4	25.2	79.0
	5/16	43.5	118.0
Button Stops	3/32	2.3	7.8
	1/8	2.1	7.0
	5/32	3.7	11.8
	3/16	3.5	10.6
	1/4	21.0	62.0

- Sleeves and Stops for cable diameters 1/16" through 3/8"
- Aluminum, Copper, or Zinc Plated Copper
- Stainless fittings on special order
- Packed: 100 pcs. and 1,000 pcs. carton

Sleeves, when properly applied, are capable of holding the rated breaking strength of the cable to which they are applied.

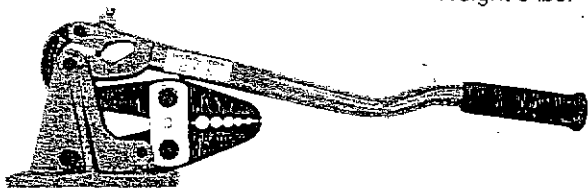
Stops are capable of holding one third to one half the rated breaking strength of the cable.

## Swaging Tools

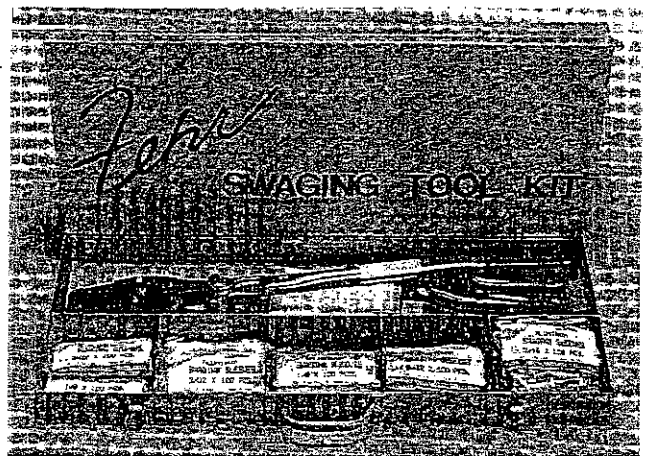


**No. 1SC**  
One tool for all your swaging needs.  
Swages 1/16, 3/32, 1/8, 5/32 and 3/16.  
Built in cutter head on tool.  
Includes go/no-go gauge.  
Length 24" Weight 5.5 lbs.

**No. 1BSC**  
Same capacity as  
No. 1SC Hand Tool  
Weight 8 lbs.



## Swaging Kit



### Complete Swaging Tool Kit contains:

- No. 1SC Swaging Tool
- Aluminum Sleeves: 1/16, 3/32, 1/8, 5/32, 3/16 in 100 pc. bags
- Metal carrying case
- C-7 Cutting Tool
- Aluminum Button Stops: 3/32, 1/8 in 100 pc. bags

# ABS

A Company in the Cardo Group

## ENGINEERING DATA SHEET

PREPARED:           R.A.          

DATE:           4-6-92          

PG.   1   OF   2  

V024-16-007

### Support Grips

## KELLEMS®

Kellems Support Grips are used to hold the weight of electrical cable as it hangs in a vertical, sloping or horizontal position. Electrical cable must be supported, or its dead weight can cause excessive strain or pullout at the connections resulting in power failure. Support grips also absorb additional strain from flexure, vibration, expansion and contraction.

Kellems Support Grips listed in this catalog are made of high grade, non-magnetic tin coated bronze strand. Stainless steel grips, made of alloy 302/304 SST for severe service or unusual environmental conditions, are available on request.

#### ■ Select the Correct Support Grip

Each Kellems grip is designed to work on a specific range of cable diameters.

Step 1. Refer to the Kellems chart below to determine the grip style best suited for your application.

Step 2. Determine your cable *outside diameter*.

Step 3. Find the grip size that encompasses your cable diameter.

Step 4. Whenever possible, use a closed mesh that assembles over the cable end. If the cable end is not available, use a split mesh.

Step 5. Where available, select an eye style that suits your needs.

Step 6. Select the proper material—tinned bronze or stainless steel. ←

Step 7. Estimate the tension to be put on the grip, establish the working load you require and compare this to the listed approximate breaking strength of the grip to insure that the grip will be strong enough. Refer to page 83 for safety and working load considerations.

\*All catalog listed support grips are made of tin coated bronze strand. To order stainless steel support grips, change the first three catalog number digits from 022-XX-XXX to 024-XX-XXX. Consult factory for details.

#### ■ Support Grip Selection Chart

Grip Styles	Application
Closed mesh	Permanent support, cable end available
Material*	Tin coated bronze or stainless steel
Standard support grips	Support vertical runs to 99 ft. loads to 600 lbs.
Heavy duty grips	Support vertical runs over 100 ft. loads over 600 lbs.
Service drop	Light duty to support service entrance cable

#### ■ Eystyles



Single



A Company in the Cardo Group

# ENGINEERING DATA SHEET

PREPARED: R.A.

DATE: 4-6-92

PG. 2 OF 2

V024-16-007

## KELLEMS®

### Grip Selection

Use the seven steps on page 23 for proper grip selection.

### Technical Data

#### CAUTION

Never use grips up to approximate breaking strength.

For permanent support when cable end is available to be installed through grip.

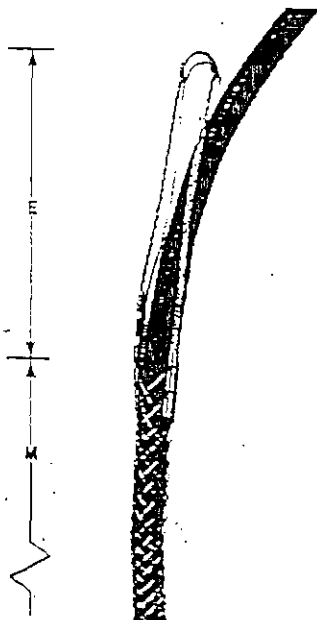
#### ■ Light Duty, Single Eye, Closed Mesh Single Weave

Catalog Numbers	Cable Diameter Range (Inches)	Approx. Breaking Strength (Lbs.)	E (Inches)	M (Inches)
022-16-001	.23-.31	290	3	3¼
022-16-002	.29-.37	290	4	4¼
022-16-003	.35-.44	500	4	4¾
022-16-004	.41-.50	500	5	5
022-16-005	.46-.56	660	6	5¼
022-16-006	.52-.62	790	7	6¼
022-16-007	.58-.68	790	7	6½
022-16-008	.64-.75	790	7	6¾
022-16-009	.70-.81	790	7	7¼
022-16-010	.75-.87	1020	8	8
022-16-011	.81-.94	1020	8	8¼
022-16-012	.87-1.00	1020	8	8¾
022-16-013	.94-1.06	1020	9	9
022-16-014	1.00-1.18	1020	9	9½
022-16-015	1.06-1.25	1020	9	9¾

## Support Grips

### Service Drop

Consult the factory if modified or specially designed products are needed. Minimum quantities required.



Light duty, single eye,  
Closed mesh, single weave



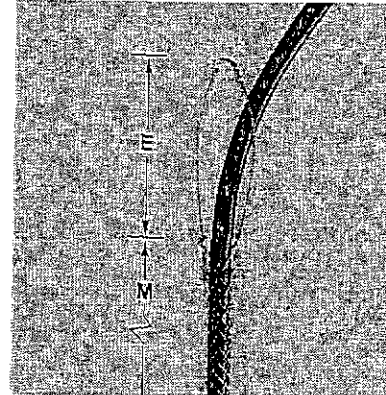
### Single Eye, Closed Mesh\*

For permanent support when cable end is available to be installed through grip.

Cable Diameter Range inches (cm)	Approx. Breaking Strength Lbs. (N)	E inches (cm)	M inches (cm)	Catalog Numbers
.50"- .62" (1.27-1.57)	530 (2,357)	7" (17.78)	10" (25.40)	02201013
.63"- .74" (1.60-1.88)	790 (3,514)	8" (20.32)	10" (25.40)	02201014
.75"- .99" (1.90-2.51)	1,020 (4,537)	8" (20.32)	13" (33.02)	02201015
1.00"-1.24" (2.54-3.15)	1,610 (7,161)	9" (22.86)	14" (35.56)	02201017
1.25"-1.49" (3.17-3.78)	1,610 (7,161)	10" (25.40)	15" (38.10)	02201018
1.50"-1.74" (3.81-4.42)	1,610 (7,161)	12" (30.48)	17" (43.18)	02201019
1.75"-1.99" (4.44-5.05)	2,150 (9,563)	14" (35.56)	19" (48.26)	02201020
2.00"-2.49" (5.08-6.32)	3,260 (14,500)	16" (40.64)	21" (53.34)	02201021
2.50"-2.99" (6.35-7.59)	3,260 (14,500)	18" (45.72)	23" (58.42)	02201022
3.00"-3.49" (7.62-8.86)	4,900 (21,795)	21" (53.34)	25" (63.50)	02201023
3.50"-3.99" (8.89-10.13)	4,900 (21,795)	24" (60.96)	27" (68.58)	02201024

### IMPORTANT!

It is important that you read all breaking strength, safety and technical data relating to this product on pages T-43 through T-48.

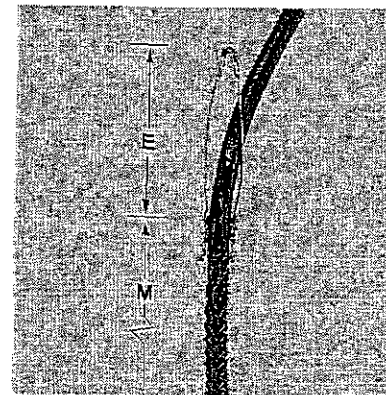


Single Eye, Closed Mesh

### Single Eye, Split Mesh, Lace Closing\*

For permanent support when cable end is not available.

Cable Diameter Range inches (cm)	Approx. Breaking Strength Lbs. (N)	E inches (cm)	M inches (cm)	Catalog Numbers
.50"- .62" (1.27-1.57)	530 (2,357)	7" (17.78)	10" (25.40)	02202013
.63"- .74" (1.60-1.88)	790 (3,514)	8" (20.32)	10" (25.40)	02202014
.75"- .99" (1.90-2.51)	1,020 (4,537)	8" (20.32)	13" (33.02)	02202015
1.00"-1.24" (2.54-3.15)	1,610 (7,161)	9" (22.86)	14" (35.56)	02202017
1.25"-1.49" (3.17-3.78)	1,610 (7,161)	10" (25.40)	15" (38.10)	02202018
1.50"-1.74" (3.81-4.42)	1,610 (7,161)	12" (30.48)	17" (43.18)	02202019
1.75"-1.99" (4.44-5.05)	2,150 (9,563)	14" (35.56)	19" (48.26)	02202020
2.00"-2.49" (5.08-6.32)	3,260 (14,500)	16" (40.64)	21" (53.34)	02202021
2.50"-2.99" (6.35-7.59)	3,260 (14,500)	18" (45.72)	23" (58.42)	02202022
3.00"-3.49" (7.62-8.86)	4,900 (21,795)	21" (53.34)	25" (63.50)	02202023
3.50"-3.99" (8.89-10.13)	4,900 (21,795)	24" (60.96)	27" (68.58)	02202024

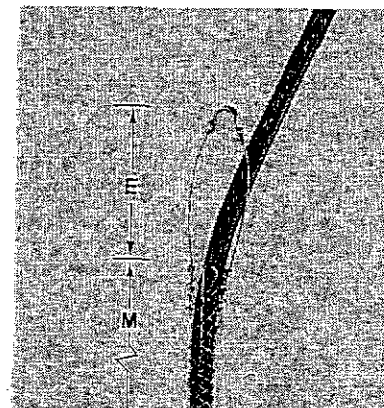


Single Eye, Split Mesh, Lace Closing

### Single Eye, Split Mesh, Rod Closing\*

For support when cable end is not available.

Cable Diameter Range inches (cm)	Approx. Breaking Strength Lbs. (N)	E inches (cm)	M inches (cm)	Catalog Numbers
.50"- .62" (1.27-1.57)	790 (3,514)	7" (17.78)	8 1/2" (21.59)	02203013
.63"- .74" (1.60-1.88)	790 (3,514)	8" (20.32)	8 1/2" (21.59)	02203014
.75"- .99" (1.90-2.51)	1,020 (4,537)	8" (20.32)	10 1/2" (26.67)	02203015
1.00"-1.24" (2.54-3.15)	1,610 (7,161)	9" (22.86)	12 1/2" (31.75)	02203017
1.25"-1.49" (3.17-3.78)	1,610 (7,161)	10" (25.40)	14 1/2" (36.83)	02203018
1.50"-1.74" (3.81-4.42)	1,610 (7,161)	12" (30.48)	16 1/2" (39.37)	02203019
1.75"-1.99" (4.44-5.05)	2,150 (9,563)	14" (35.56)	18 1/2" (41.91)	02203020
2.00"-2.49" (5.08-6.32)	3,260 (14,500)	16" (40.64)	19 1/2" (49.53)	02203021
2.50"-2.99" (6.35-7.59)	3,260 (14,500)	18" (45.72)	21 1/2" (54.61)	02203022
3.00"-3.49" (7.62-8.86)	5,750 (25,576)	21" (53.34)	23 1/2" (59.69)	02203023
3.50"-3.99" (8.89-10.13)	5,750 (25,576)	24" (60.96)	25 1/2" (64.77)	02203024



Single Eye, Split Mesh, Rod Closing

E-Eye length M-Mesh length at nominal diameter

\* Change catalog number from 022 to 024 for stainless steel. Consult factory for availability.

TO POWER,  
AND MOTOR  
STARTERS,  
IF REQUIRED

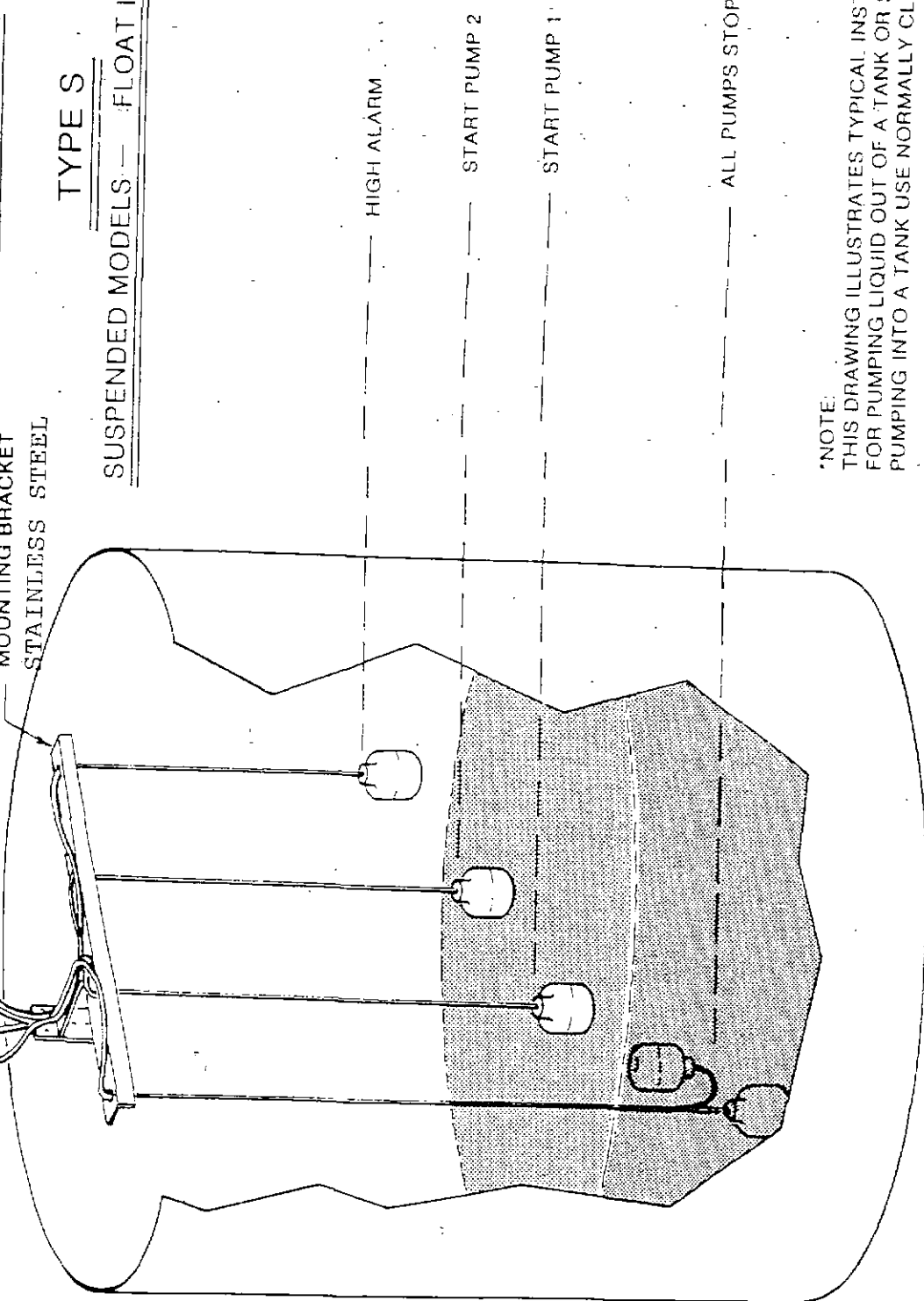
JUNCTION BOX (BY OTHERS)

MOUNTING BRACKET  
STAINLESS STEEL

# \*PUMP OUT

## TYPE S

### SUSPENDED MODELS — FLOAT INSTALLATION



HIGH ALARM

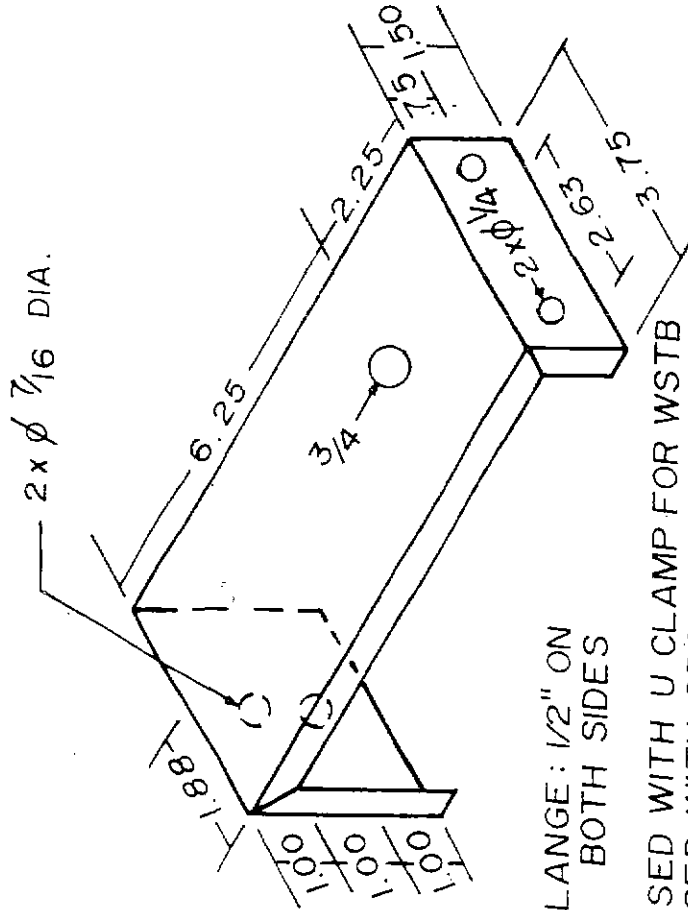
START PUMP 2

START PUMP 1

ALL PUMPS STOP

\*NOTE:  
THIS DRAWING ILLUSTRATES TYPICAL INSTALLATIONS  
FOR PUMPING LIQUID OUT OF A TANK OR SUMP. FOR  
PUMPING INTO A TANK USE NORMALLY CLOSED FLOATS.

**BASE BRACKET**  
**WMS, WMP, WSTB, and S-4**

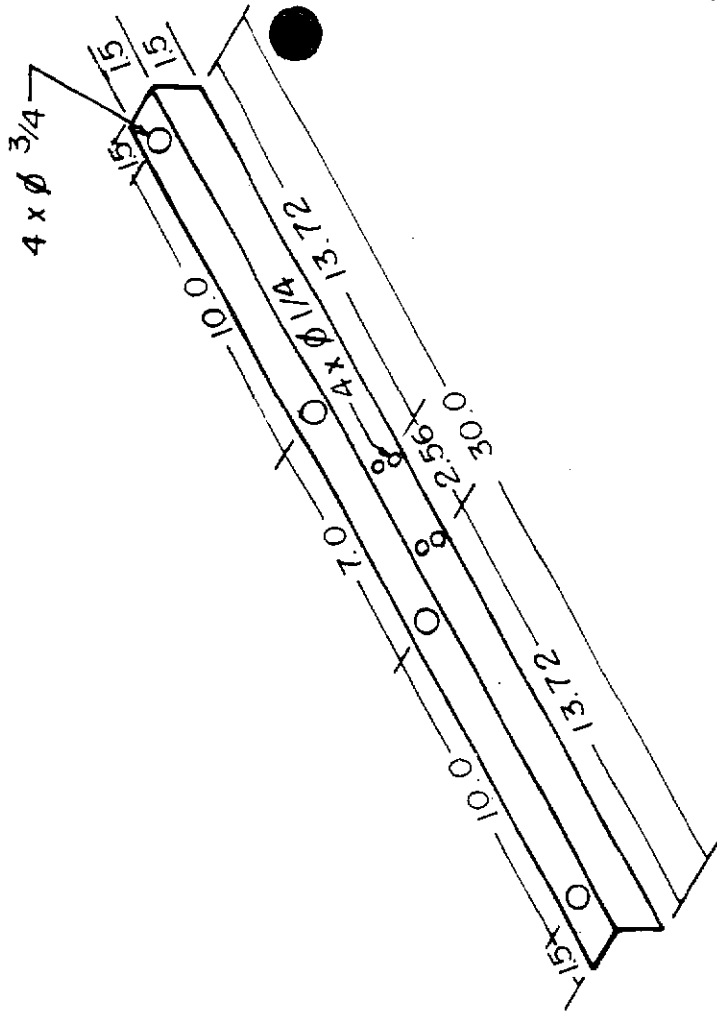


FLANGE: 1/2" ON  
 BOTH SIDES

USED WITH U CLAMP FOR WSTB  
 USED WITH GROMMET FOR WMS  
 USED AS IS FOR WMP

16 GA.  
 316 SERIES  
 STAINLESS  
 STEEL

**S-4 LONG BRACKET**



USED WITH WMP TO FORM S-4 BRACKET  
 GROMMETS SUPPLIED

16 GA. 300 SERIES STAINLESS STEEL

**ANCHOR SCIENTIFIC INC.**

LONG LAKE, MN.

DRAWN BY	CFCIII	DATE	8/13/85	REVISIONS	DATE
CHECKED BY	JTP	DATE	8/13/85		
APPROVED BY	JTP	DATE	8/13/85		
SCALE:	1:30, 1:60				

TITLE  
**BRACKET DIM.**  
 WMS, WMP, WSTB, and S-4

DRAWING NUMBER

**9010-2**



**anchor scientific inc.**

Box 378, Long Lake, MN 55356

952-473-7115 • FAX 952-473-6002 • www.anchorscientific.com

**mini-float®**

Form 2500-D

# mini-float®

## MOUNTING STYLES

### DESCRIPTION

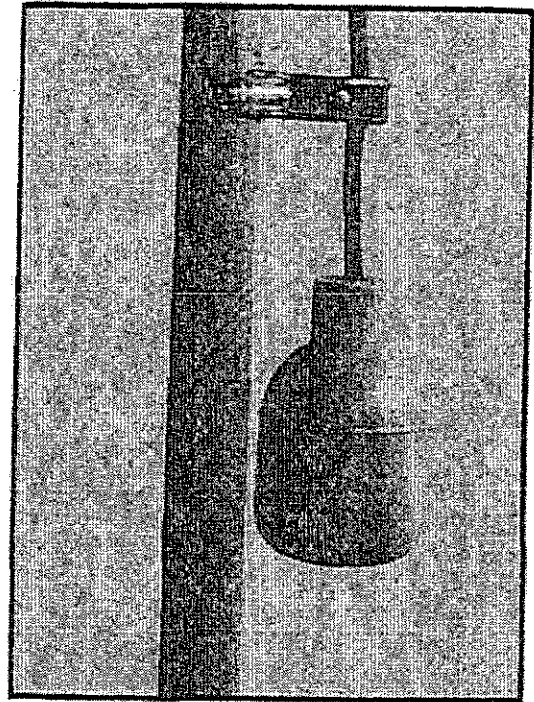
Mini-floats are pilot duty devices designed for small diameter sumps and places where space is a determining factor in the selection of a level control device. Mini-floats control the function of motor load devices, such as contactors, motor starters, and power relays, to automatically cycle a pump or pumps. They can also be used for alarm signaling devices. Two Mini-Floats are needed for a one-pump operation; three for a two-pump operation.

### SPECIFICATIONS

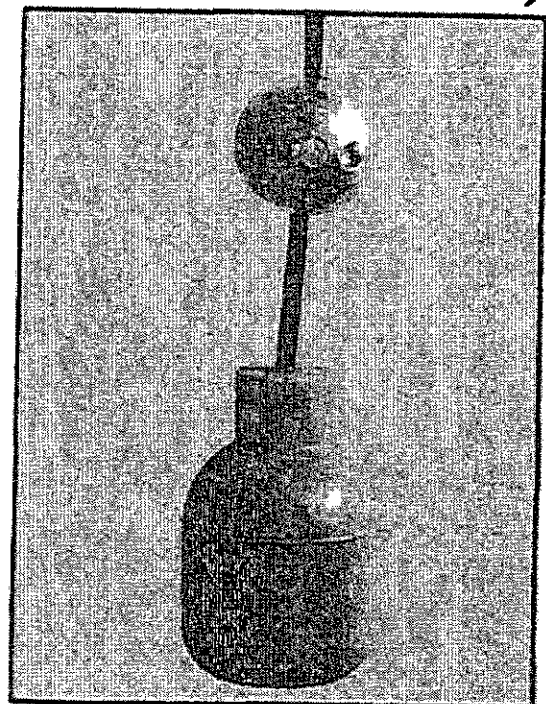
Cable ..... 18-2 SJO W/A  
 Housing ..... Polypropylene  
 Clamp ..... Adjustable 1"-4"  
 (Only on Type P models)  
 Temperature Rating ..... 60° C.

### MODELS

Mini-Floats are available in a combination of mounting styles, cable lengths, and circuit configurations. Mounting styles are shown at right: pipe mounted (Type P), and suspended (Type S). 10, 15, and 25-foot cable lengths are standard, but other lengths can be special ordered. Electrical configurations must be specified; normally open, (NO), for pump out applications and normally closed, (NC), for pump in applications.



TYPE P - M

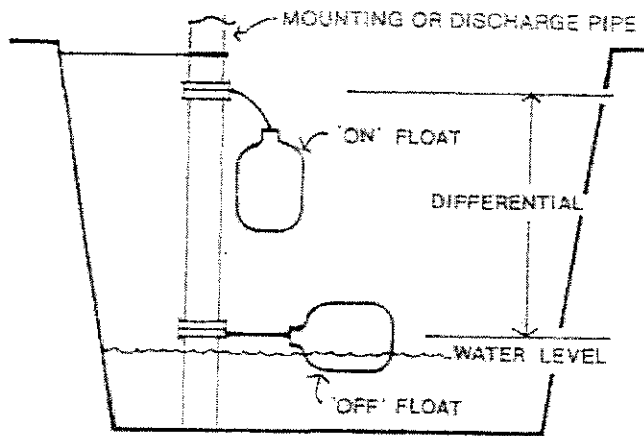


TYPE S - M

### EXAMPLE:

S Mounting Style	M Mini- Float	60 Cable Length	NO Electrical Configuration
ELECTRICAL CONFIGURATION	CABLE LENGTH	SUSPENDED TYPE 'S'	PIPE MOUNTED TYPE 'P'
		MODEL NO.	MODEL NO.
NORMALLY OPEN	10	S M 10 NO	P M 10 NO
	15	S M 15 NO	P M 15 NO
	20	S M 20 NO	P M 20 NO
	25	S M 25 NO	P M 25 NO
	25 60	S M 60 NC	P M 30 NO
NORMALLY CLOSED	10	S M 10 NC	P M 10 NC
	15	S M 15 NC	P M 15 NC
	20	S M 20 NC	P M 20 NC
	25	S M 25 NC	P M 25 NC
	30	S M 30 NC	P M 30 NC

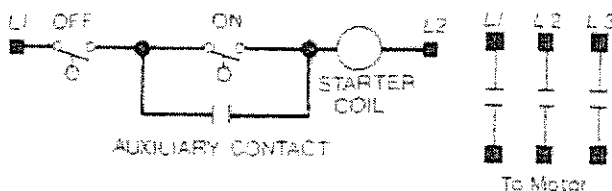
### TYPICAL INSTALLATION



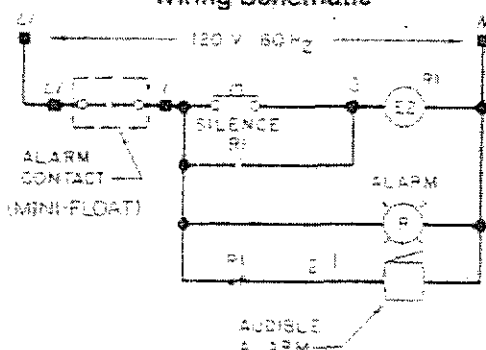
### General Comments

- 1) Never work in the sump with the power on.
- 2) Attach the Type P Mini-Floats to the mounting pipe or the pump discharge pipe. The 'off' float should be below the 'on' float in a 'pump out' application.
- 3) Arrange the Mini-Floats so they do not tangle or hang up.
- 4) Thread the cable strap through the buckle with the ratchet pawl; cinch up tight; thread excess strapping through outer buckle slot.
- 5) Measuring the difference between mounting points gives the 'pump down' differential.

Typical Simplex Wiring Schematic



Typical Alarm Wiring Schematic



### SPECIFICATIONS

Cable - 18-2 SJO W/A 34 x 41 strand, 90°C, DIAMETER .30

Float - Polypropylene.

Clamp - Stainless Steel.

UL Listed Ind. Con. Eq. 125 VA @ 115 VAC

Component 4.5A @ 120V, Res.  
Switch Rating 2.2A @ 230V, Res.

Temperature Rating - 60 C.

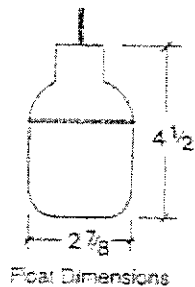
Normally Open - Blue Housing  
Normally Closed - Red Housing

ELECTRICAL CONFIGURATION	CABLE LENGTH	SUSPENDED TYPE 'S'	PIPE MOUNTED TYPE 'P'
		MODEL NO.	MODEL NO.
NORMALLY OPEN	10	S M 10 NO	P M 10 NO
	15	S M 15 NO	P M 15 NO
	20	S M 20 NO	P M 20 NO
	25	S M 25 NO	P M 25 NO
	30	S M 30 NO	P M 30 NO
NORMALLY CLOSED	10	S M 10 NC	P M 10 NC
	15	S M 15 NC	P M 15 NC
	20	S M 20 NC	P M 20 NC
	25	S M 25 NC	P M 25 NC
	30	S M 30 NC	P M 30 NC

SUBMITTAL APPROVAL


NAME \_\_\_\_\_

DATE \_\_\_\_\_



\* Important Notes - Mini-Floats are pilot duty devices. They cannot be used to directly power pump motors. Also, do not use Mini-Floats in gasoline or other combustibles. These devices can be used with intrinsically safe relays for some hazardous locations. See Sec. 500 of NEC.

This product contains mercury. Dispose of in accordance with Local, State and Federal Regulations so that mercury does not contaminate the environment.  
Not for use in potable water.

DWN BY <b>PD</b> DATE <b>7-17-80</b>		<b>anchor scientific inc.</b> Industrial Park, Long Lake, MN 55365 952-473-7115
CKB BY <b>JTP</b> DATE <b>7-20-80</b>		
APPR BY <b>JTP</b> DATE <b>7-20</b>	Typical installation and specification data for Mini-Floats	
PROJECT NAME <b>Mini-Float</b>	DWG NO <b>2510-B</b>	
FACTORY ORDER NO.		