

A. GENERAL INFORMATION

Exam Date: 8/12/2009

1. Current Owner: MIPAD LIMITED PARTNERSHIP
PO BOX 467
JEROME ID 83338
(208)329-0055
2. Accompanied by: Chris Dugan
Phone No: cell (208) 969-0041, office (208) 324-6741
Email: chris@dugandairy.net
Address: 114 S. 400 W., Jerome, ID 83338
Relationship to Permit Holder: Son/Partner

TRIBUTARY

GROUND WATER

1. Other water rights with the same place of use: NONE
2. Other water rights with the same point of diversion: NONE

1. LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER	NW1/4NW1/4	Sec. 28,	Twp 08S,	Rge 16E, B.M.
JEROME County				
GROUND WATER	NW1/4NW1/4	Sec. 28,	Twp 08S,	Rge 16E, B.M.
JEROME County				

Method of Determination: GPS/Garmin

2.

PLACE OF USE: STOCKWATER

[illegible]

PLACE OF USE: COMMERCIAL

[illegible]

Method of Determination:

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☒ Photo of Diversion and System Attached

4.

<u>Well or Diversion</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge</u>
<u>ID No.*</u>					<u>Size</u>
West Well/A0004660		7.5	(No Tag)	StaRite	3"
East Well/A0004661		7.5	(No Tag)	StaRite	3"

*Code to correspond with No. on map and aerial photo (WELL AND PUMP INFORMATION OBTAINED BY ORIGINAL OWNER: WAYNE HAWKINS 302 S 230 W, JEROME, ID 83338 208-280-4382 OR 208-324-5660)

D. FLOW MEASUREMENTS

1.

<u>Measurement</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
<u>Equipment</u>						
3" Magnetic Dan Foss Totalizing Flow Meter				489133N162	3"	installed 2002**

2. Measurements:

** 9/1/2009, the manufacture of the Dan Foss Totalizing Flow Meter was contacted (Dennis Rainey, Representative) at (877) 336-5444. Dennis stated that the Dan Foss Totalizing Flow Meter did not require to be calibrated, since there are "no moving parts that need to be calibrated." The maximum capacity that can be measured by the Dan Foss Meter is 790.0 gpm.

9/1/2009 Larry Eaton, Eaton Drill (208) 536-2223, gave information on the Dan Foss Totalizing Flow Meter. He stated that the flow meter was installed in 2002.

E. FLOW CALCULATIONS

____ Additional Computation Sheets Attached

Measured Method:

$$123.0 \text{ GPM} \times 0.00223 \text{ CFS/GPM} = 0.27429 = 0.27 \text{ CFS}$$

WMIS 7/24/2009 MEASUREMENT: 110.17 Adjusted AF (validated by Water Master: Cindy Yenter, based on 1850 head dairy----report in file)

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: N/A
2. Volume Calculations for Other Uses:

Stockwater:

At time of Field Inspection: Required (1850 head X 35 gpd/head X 365 days)/325,850 = 72.5 AF
 Potential 0.027429 cfs X 365 days X 1.9835 = 198.5 AF
 V = 72.5 AF

Permitted # Head: Required (700 dairy X 35 gpd/head X 365 days)/325,850 = **27.44 AF**
 Potential 0.027429 cfs X 365 days X 1.9835 = 198.5 AF
 V = 27.44 AF for 700 dairy

Required (800 range X 12 gpd/head X 365 days)/325,850 = **10.75 AF**
 Potential (same as dairy, listed above)
 V = 10.75 AF

Total V = 27.44 (dairy) + 10.75 (range) = 38.2 AF

To calculate the required proportions that makes up the total volume for 700 dairy & 800 range:

1850 head Stockwater:	72.5 AF X 700 dairy/1850 =	27.43 AF
	Required volume for 800 range =	10.75 AF
Commercial:	37.7 AF X 1500 head/1850 =	30.57 AF
Total:	110.17 AF	<u>68.75 AF = 68.7 AF</u>

(110.17 AF is used as the total for 1850 head, due to the WMIS calculations submitted by the Water Master—calculation report is in the file)

FEES PAID: \$100 0.21 – 1.00 cfs 21 – 100 AF

G. NARRATIVE/REMARKS/COMMENTS

Description of the Water System: 2 wells within 25' of each other. West Well/A0004660 (drilled 4/12/1982) is: 10" diameter hole, reducing to 8 5/8" casing at 19', depth 250', static 173', 7.5 Hp StaRite submersible pump set at 173', 3" discharge reducing to 2" then combined with East Well/A0004661. The East Well/A0004661 (drilled 4/18/1983) is: 10" diameter hole, reducing to 8 5/8" casing at 23', depth 250', static 197', 7.5 Hp StaRite submersible pump set at 173', 3" discharge reducing to 2" then combined with the West Well. The system runs at 120 psi (in the pump house there are 2 well-x-trol 125 gallon pressure tanks, 1 well-mate pressure tank, and 1 well-x-trol 50 gallon pressure tank). The combined flow diverts through a 3" magnetic Dan Foss totalizing flow meter (Serial # 489133N162), then reduces to 2" and is discharged throughout the dairy facility and stocktanks in the yard/barn. Both wells were drilled by Smith Drilling & Pump Inc. #11. There is One 3000-gallon milk tank, one 4000-gallon milk tank, twenty 2100-detackers, 20 back flush units, 700+ lock ups, a commodity barn with pens, and 4 silage pits. A lagoon with a manure separator with a floating pump that discharges effluent 2 – 3 days per year to the 70-acre pivot is located in Section 28 NENW and NWNE, but is not included in the POU due to the effluent only discharged for a short period of time, and not the source for irrigation. The same 70-acre pivot is utilized for irrigation through shares owned from the irrigation company.

The location of the West Well/A0004660, marked on the Well Driller's Report, Wayne Hawkins stated is incorrect, and should be NWNW like the East Well/A0004661, since they are only about 25' apart.

The wells also supply domestic water to the home located southwest of the milking barn.

Per Jeff Peppersack 9/2/2009, originally land application for effluent from lagoons was described on a water right. The Effluent is a by-product from the lagoons, and is not used for irrigation since there is such a small amount that is dispersed within 2 -3 days, so for this reason the location of the lagoons and 70-acre pivot is not included in the Place of Use. The applicant owns shares through the irrigation district utilized for irrigation through the same 70-acre pivot.

Chris Dugan's engineer: Matt Thompson (208) 736-1954 X 103. matt@agtec.us

Stockwater is supplied through 46 tanks throughout the POU, ranging from 100 – 300 gallons each; at time of field inspection: for 1,700 head milkers, and 150 replacement milkers (PERMIT AND PROOF OF BENEFICIAL USE IS FOR 700 DAIRY, 800 RANGE).

Commercial use involves the dairy, cleaning, milking (10 minutes/cow to milk, with a 10 ½ hour cycle to milk), washing cows, wash machines (towels), etc. The dairy runs 24 hours per day with 17 employees working 10 hour overlapping shifts.

Directions: E. on I84, Exit 165, turn Rt., right West Rd, left S. 400 W, and physical address: 114 S. 400 W., Jerome,

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
STOCKWATER	01/01 to 12/31	0.27 CFS	68.7 AF
COMMERCIAL	01/01 to 12/31	0.27 CFS	68.7 AF
<u>Totals:</u>		0.27 CFS	68.7 AF

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name Sandy Homewood Date 9/9/09

Reviewer _____ Date _____

* See 9/15/09 Memo for final recommendations

100 Street

114 S. 400 W.

Milking Building

house

office

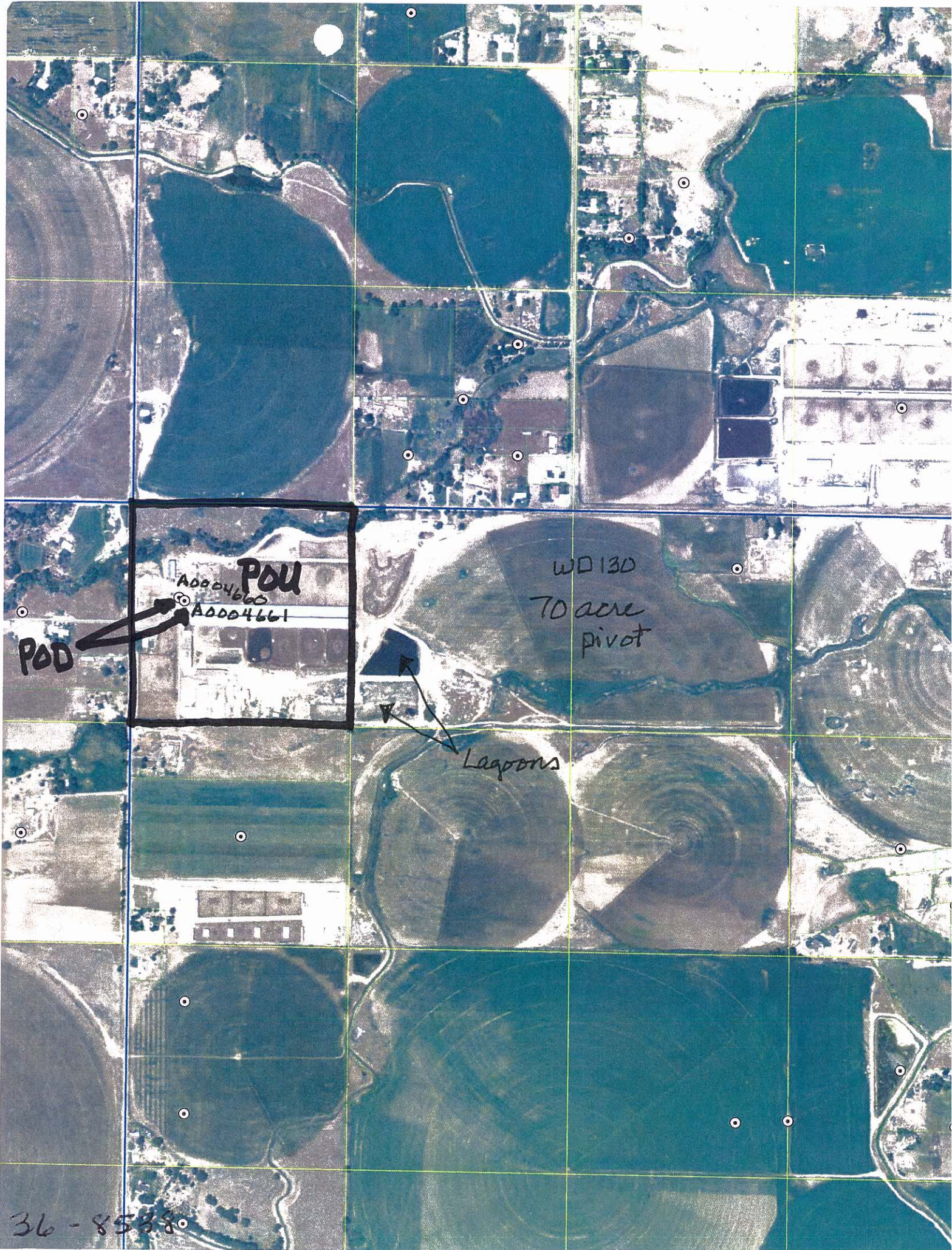
A0004660 (Main well)

A0004661 (Auxiliary well)

2 wells
w/1 flowmeter
WD130

36-8538

8/12/2009 S. Hemmenway



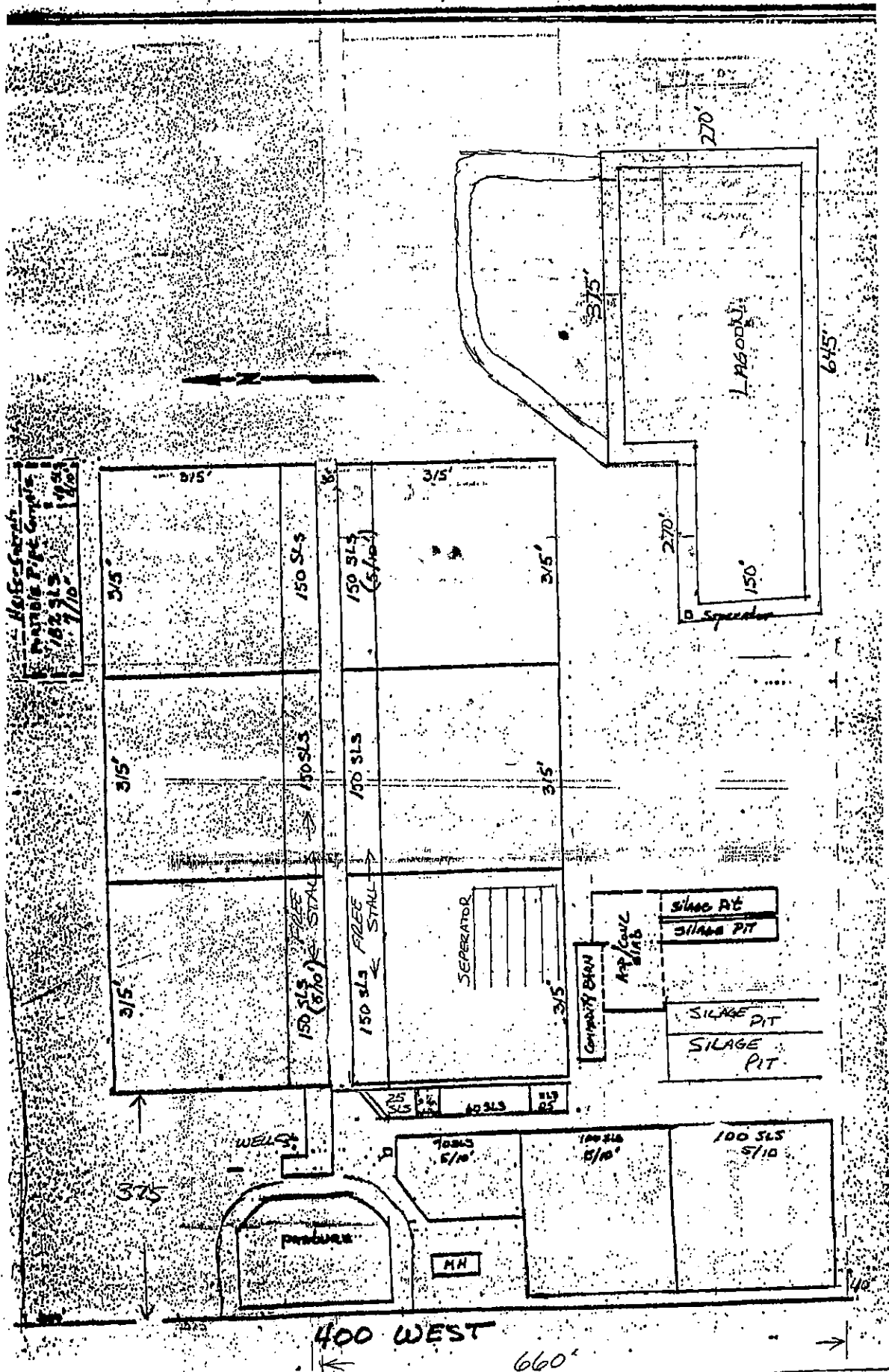
POU
A0004600
A0004661
POD

WD130
70 acre
pivot

Lagoons

36-8588

SANDY HEMENWAY-



DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

BALLPOINT PEN

REC-100

APR 25 1987

WELL OWNER

Name Magic Valley Dairy Supply
Address Jerome
Owner's Permit No. _____

7. WATER LEVEL

Static water level 197 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature _____ °F. Quality _____

NATURE OF WORK

New well ☐ Deepened ☐ Replacement
Abandoned (describe method of abandoning) _____

8. WELL TEST DATA NONE

☐ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped

PROPOSED USE

Domestic ☐ Irrigation ☐ Test ☐ Municipal
Industrial ☒ Stock ☐ Waste Disposal or Injection
Other _____ (specify type)

9. LITHOLOGIC LOG

Hole Diam.	Depth		Material	Water	
	From	To		Yes	No
10	0	10	Top Soil - Sand		X
10/8	10	28	Med Hard Gray Basalt w/sm. breaks		
8	23	27	Med Hard Gray Basalt w/lg. breaks-trace		
	27	30	Med Hard Gray Basalt w/lg. breaks-crevices		
	30	36	Hard Gray Basalt w/sm. breaks		
	36	50	Med Hard w/lg. breaks-crevices		
	50	63	Med Soft w/small breaks		
	63	70	Med Hard w/large breaks		
	70	76	Med Hard Gray Basalt w/trace Br. basalt		
	76	90	Med Hard Br. Basalt w/lg. breaks-crevices		
	90	107	Hard Gray Basalt		
	107	110	Med Hard w/large breaks		
	110	130	Med Hard Gray Basalt w/small breaks		
	130	144	Med Hard Gray Basalt w/lg. breaks		
	144	150	Med Hard w/large breaks-crevices		
	150	152	Med Hard w/large breaks		
	152	157	Med Hard w/small breaks		
	157	170	Med Hard Gray Basalt w/sm. breaks-trace		
	170	181	Med Hard Gray Basalt w/lg. breaks		
	181	190	Med Soft Br. Basalt w/lg. breaks-crevices		
			soft spots trace brown clay trace w/		
	190	204	Med Hard Br. Basalt w/lg. breaks		
			trace Br. Basalt w/Hard Brown Clay		
	204	210	Med Hard w/lg. breaks Crevices-trace w/		
	210	218	Med Hard Gray Basalt w/lg. breaks		
	218	230	Hard Gray Basalt w/sm. breaks		
	230	244	Med Soft Gray Basalt w/lg. breaks		
	244	250	Med Soft w/lg. breaks crevices		

METHOD DRILLED

Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
Cable ☐ Dug ☐ Other _____

WELL CONSTRUCTION

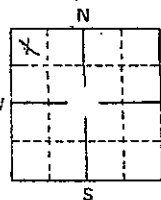
Drilling schedule: ☒ Steel ☒ Concrete ☐ Other _____
Thickness _____ Diameter _____ From _____ To _____
250 inches 8 5/8 inches 2 feet -18 feet
_____ inches _____ inches -18 feet -157 feet
_____ inches _____ inches _____ feet _____ feet
_____ inches _____ inches _____ feet _____ feet
Is casing drive shoe used? ☐ Yes ☒ No
Is a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches
Number _____ From _____ To _____
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Gravel packed? ☐ Yes ☒ No Size of gravel _____
Screened from _____ feet to _____ feet
Surface seal depth 18 Material used in seal: ☐ Cement grout
☒ Pudding clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing
☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded ☐ Solvent
Weld
☐ Cemented between strata
Describe access port _____

10.

Work started 4/8/83 finished 4/18/83

LOCATION OF WELL

Sketch map location must agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
Jerome

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name SMITH DRILLING & PUMP CO., INC. 11

Address Jerome Date 4/20/83

Signed by (Firm Official) [Signature]
and
(Operator) [Signature]

West
East well
A0004661

DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

BALLPOINTE PEN

State law requires that this report be filed with the Director, Department of Water Resources
within 30 days after the completion or abandonment of the well.

1112 1007

ELL OWNER

Name Wayne Hawkins
Address Jerome,
Owner's Permit No. _____

7. WATER LEVEL

Department of Water Resources
Static water level 173 feet below ground surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature _____ °F. Quality _____

ATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning) _____

8. WELL TEST DATA NONE

☐ Pump ☐ Bailor ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped

ROPOSED USE

☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☒ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

9. LITHOLOGIC LOG

Hole Diam.	Depth		Material	Water	
	From	To		Yes	No
10	0	2	Top Soil		X
	2	16	Hard Gray Basalt w/lg. breaks		
	16	19	Hard Gray Basalt		
8	19	30	Hard Gray Basalt w/lg. breaks		
	30	36	Med Hard Brown Basalt w/lg. breaks		
	36	70	Med Hard Gray Basalt w/lg. breaks		
	70	75	Med Hard Gray Basalt w/lg. breaks		
	75	83	Med Hard Brown Basalt w/lg. breaks		
	83	90	Med Hard Gray Basalt w/sm. breaks		
	90	110	Hard Gray Basalt w/sm. breaks		
	110	130	Med Hard Gray Basalt w/lg. breaks		
	130	150	Med Hard Brown Basalt w/lg. breaks		
	150	170	Med Hard Gray Basalt w/lg. breaks		
	170	180	Med Hard Gray Basalt w/lg. breaks		
	180	190	Med Soft Gray Basalt w/trace		
	190	194	Med Hard Gray Basalt w/lg. breaks		
	194	230	Med Hard w/lg. breaks		
	230	250	Med Hard w/lg. breaks		

ETHOD DRILLED

☐ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other _____

WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____
Thickness _____ Diameter _____ From _____ To _____
_____ inches 8 5/8OD inches + 1 feet -19 feet
_____ inches _____ inches _____ feet _____ feet
_____ inches _____ inches _____ feet _____ feet
_____ inches _____ inches _____ feet _____ feet
Casing drive shoe used? ☐ Yes ☒ No
Packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches
Number _____ From _____ To _____
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet
_____ perforations _____ feet _____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Diameter _____ Slot size _____ Set from _____ feet to _____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 18 Material used in seal: ☐ Cement grout
☒ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing
☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded ☐ Solvent
Weld
☐ Cemented between strata

Describe access port _____

10.

Work started 4/11/82 finished 4/12/82

LOCATION OF WELL

Sketch map location must agree with written location.

N
W E
S
Subdivision Name _____
Lot No. _____ Block No. _____
County _____ Jerome

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were
complied with at the time the rig was removed.

Firm Name SMITH DRILLING & PUMPING CO. INC. 11

Address Jerome Date 4/14/82

Signed by (Firm Official) _____

and _____
(Operator) _____

West well
A0004660

(incorrect QQ marked -
should be NW NW)

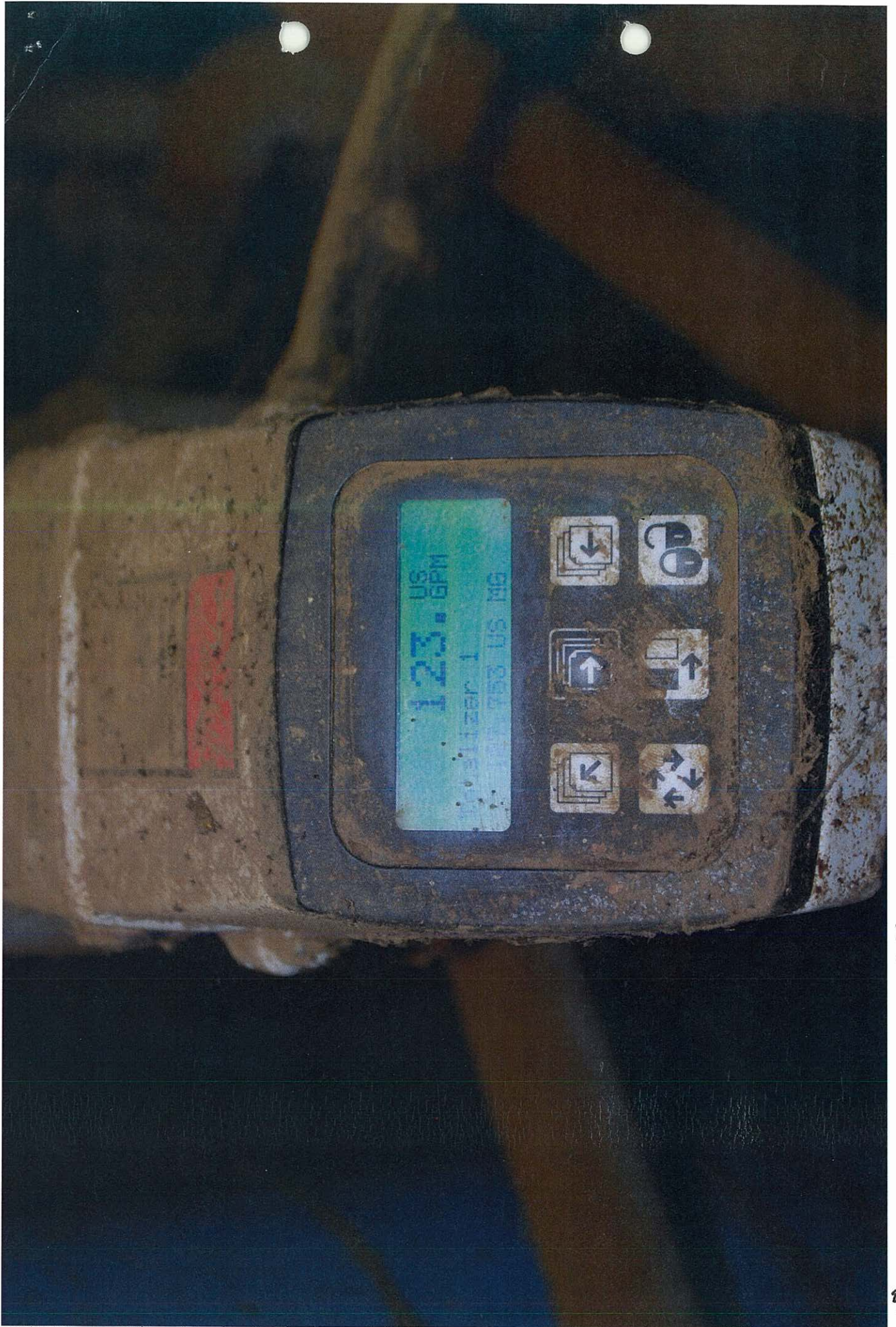


POD:

West
Well
A000466



East
Well
A000464



123.0
gpm

8/12/10



3"
magnet
Dan Fox
Totalizing
Flow
Meter
489133N

08/12/2009



46
Stock
Tanks
ranging
from
100-300
gallon
each

08/12/2009

36-8538 MIPAD Limited Partnership

S. Hemenway



Commercial
Milk
Barn



36-8538 MIPAD Limited Partnership

S. Hemenway



36-8538 MIPAD Limited Partnership

S. Hemenway

stock lot, and home located southwest of milking barn.

Hemenway, Sandy

Subject: FW: Dan Foss 3" Magnetic Flow meter -- information request

From: Dennis Rainey [mailto:drainey@branom.com]
Sent: Thursday, September 03, 2009 12:41 PM
To: Hemenway, Sandy
Subject: RE: Dan Foss 3" Magnetic Flow meter -- information request

Sandy:

Siemens purchased the magmeter division of Danfoss in 2003.

We began to see the former "Danfoss" meters show up with Siemens logos and part numbers in 4Q2003.

Hope this helps.

Best regards,

Dennis Rainey
Branom Instrument Co./Boise

From: Hemenway, Sandy [mailto:Sandy.Hemenway@idwr.idaho.gov]
Sent: Thursday, September 03, 2009 12:08 PM
To: Dennis Rainey
Subject: RE: Dan Foss 3" Magnetic Flow meter -- information request

Hi Dennis,
When did you say that the Dan Foss Flow Meter changed it's name?

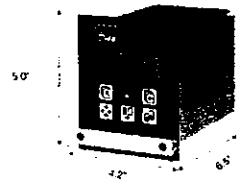
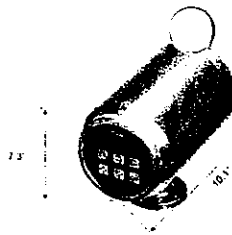
Thank you so much for the information. I really appreciate it.

Sandy

SIZING

Signal
converters

Sensors



Size (inch)	Flow rate Max (GPM)	MAG 3100 & 3100 W			MAG 1100		MAG 1100 Food	
		Pressure rate	L	A	L	A	L	A
		w. flange ANSI B16.5 (psi)	w. flange ANSI B16.5 (inch)	[inch]	incl. EPDM gaskets (inch)	[inch]	Weld in length (inch)	[inch]
1/4	5				2.52	6.14		
1/2	12				2.52	6.14	5.75	6.14
3/4	28	ANSI 150	7.87	7.4	2.56	6.14	5.75	6.14
1	75	ANSI 150	7.87	7.4	3.15	6.46	6.34	6.45
1 1/4	200	ANSI 150	7.87	7.8	3.74	6.93	6.93	6.93
2	300	ANSI 150	7.87	8.1	4.13	7.25	7.32	7.24
2 1/2	530	ANSI 150	7.87	8.4	5.12	7.64	8.78	7.64
3	790	ANSI 150	10.7	8.8	6.10	7.87	10.16	7.87
4	1200	ANSI 150	11.0	9.5	185	213	288	213
5	2000	ANSI 150	11.8	10.0				
6	2800	ANSI 150	12.8	10.9				
8	4800	ANSI 150	13.8	12.0				
10	7500	ANSI 150	17.7	13.1				
12	11000	ANSI 150	19.7	14.1				
14	15000	ANSI 150	21.7	14.3				
16	20000	ANSI 150	21.7	15.2				
18	25000	ANSI 150	23.6	16.5				
20	30000	ANSI 150	26.8	17.5				
24	44000	ANSI 150	32.2	19.5				
28	58000	AWWA C207	34.5	23.1				
30	80000	AWWA C207	36.9	21.4				
32	80000	AWWA C207	39.4	23.9				
36	97000	AWWA C207	44.3	25.7				
40	128000	AWWA C207	49.2	27.7				
48	176000	AWWA C207	59.1	31.9				
56	242000	AWWA C207	68.9	36.4				
64	348000	AWWA C207	78.7	40.4				
72	400000	AWWA C207	88.5	44.2				
80	484000	AWWA C207	98.4	48.2				

Length is without earthing flanges and gaskets. Other dimensions on request.

MEASURING ACCURACY

MAG 5000

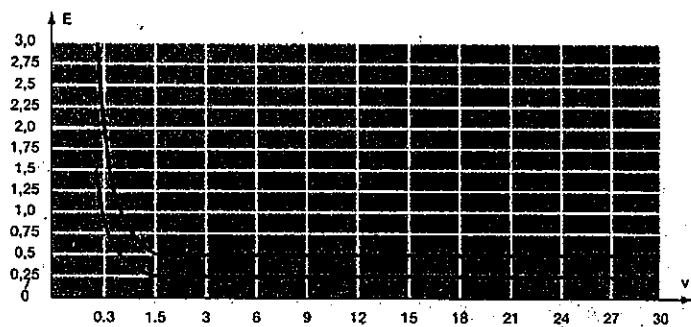
$v \geq 1.5$ ft/sec. E: $\pm 0.5\%$ of actual flow

$v < 1.5$ ft/sec. E: $\pm \frac{0.32}{v[\text{ft/sec}]} [\%]$ of actual flow

MAG 6000

$v \geq 1.5$ ft/sec. E: $\pm 0.25\%$ of actual flow

$v < 1.5$ ft/sec. E: $\pm \frac{0.41}{v[\text{ft/sec}]} [\%]$ of actual flow



v: Actual flow velocity [ft/sec]

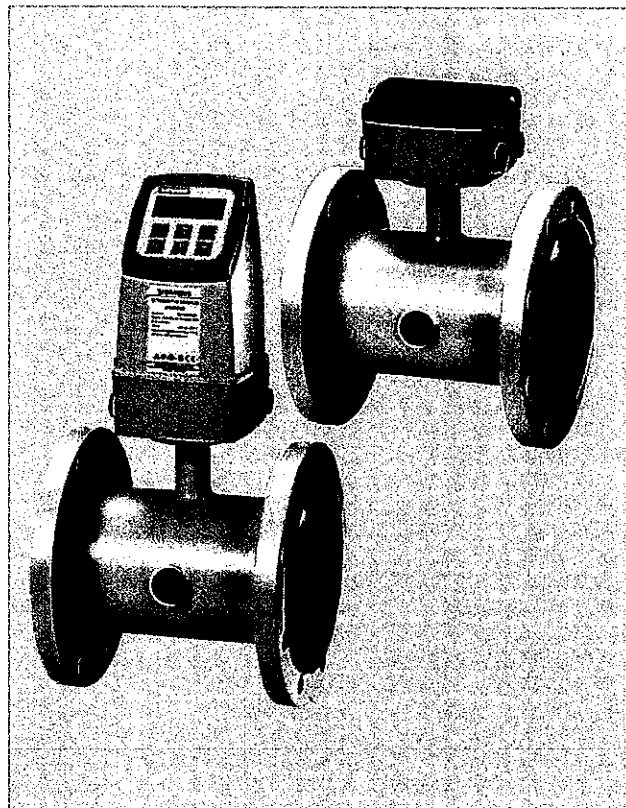
E: Meter uncertainty as a percentage of actual flow

SITRANS F flowmeters

SITRANS F M

MAG 5100 W

Overview



The SITRANS F M MAG 5100 W is an electromagnetic flow sensor designed to meet ground water, drinking water, waste water, sewage or sludge applications.

Benefits

- DN 25 to DN 1200 (1" to 48")
- Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA and AS.
- NBR Hard Rubber liner for all water applications
- Drinking water EPDM liner with approvals
- Hastelloy integrated grounding and measuring electrodes
- Increased low flow accuracy for water leak detection, due to coned liner design.
- Drinking water approvals
- Suitable for direct burial and constant flooding
- Build-in length according to ISO 13359
- Easy commissioning, SENSORPROM unit automatically uploads calibration values and settings.
- Designed that patented in-situ verification can be conducted. Using SENSORPROM fingerprint.

Application

The main applications of the SITRANS F M electromagnetic flow sensors can be found in the following fields:

- Water abstraction
- Water treatment
- Water distribution network (leak detection management)
- Custody transfer water meters
- Irrigation
- Waste water treatment
- Filtration plant (e.g. reverse osmosis and ultra filtration)
- Industrial water applications

Mode of operation

The flow measuring principle is based on Faradays law of electromagnetic induction where the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

Function

- Highly resistant to a wide range of chemicals
 - Pattern approval OIML R49 (Denmark, Germany)
 - conforms to ISO 4064 and EN 14154
 - MI-001 Custody Transfer approval for billing (EU)
- Meets EEC directives: PED, 97/23/EC pressure directive for EN1092-1 flanges
- Simple onsite or factory upgrade to IP68/NEMA 6P of a standard sensor.

Integration

The complete flowmeter consists of a flow sensor and an associated transmitter SITRANS F M MAG 5000, MAG 6000 or MAG 6000 I.

The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems, e.g. HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS DP and PA, MODBUS RTU/RS485.

Technical specifications

Design	Full bore sensor	Coned bore sensor	Full bore sensor
Nominal size	DN 25 ... 40 (1" ... 1½")	DN 50 ... 300 (2" ... 12")	DN 350 ... 1200 (14" ... 48")
Measuring principle	Electromagnetic induction		
Excitation frequency	12.5 Hz	• DN 50 ... 65 (2" ... 2½"): 12.5 Hz • DN 80 ... 150 (3" ... 6"): 6.25 Hz • DN 200 ... 300 (8" ... 12"): 3.125 Hz	1.56 Hz
Process connection			
Flanges		Flat face flanges	
• EN 1092-1	PN 40 (580 psi)	• DN 50 ... 300: PN 16 (2" ... 12": 230 psi) • DN 200 ... 300: PN 10 (8" ... 12": 145 psi)	• PN 10 (145 psi) • PN 16 (230 psi)
• ANSI B16.5	Class 150 lb	Class 150 lb ~20 bar (290 psi)	--
• AWWA C-207	--	--	28" ... 48": Class D
• AS4087	PN 16 (230 psi) DN 50 ... 1200 (2" ... 48"), 14 bar (232 psi)		
Rated Operation conditions			
Ambient temperature			
• Sensor	-40 ... +70 °C (-40 ... +158 °F)		
• With compact transmitter MAG 5000/6000	-20 ... +50 °C (-4 ... +122 °F)		
• With compact transmitter MAG 6000 I	-20 ... +60 °C (-4 ... +140 °F)		
Operating pressure (Abs)	0.01 ... 40 bar (0.15 ... 580 psi)	0.03 ... 20 bar (0.44 ... 290 psi)	0.01 ... 16 bar (0.15 ... 232 psi)
Enclosure rating			
• Standard	IP67 to EN 60529 / NEMA 4X/6 (1 mH ₂ O for 30 minutes)		
• Option	IP68 to EN 60529 / NEMA 6P (10 mH ₂ O continuously)		
Pressure drop at 3 m/s (10 ft/s)	As straight pipe	Max. 25 mbar (0.36 psi)	As straight pipe
Medium conditions			
Temperature of medium			
• NBR	-10 ... +70 °C (14 ... +158 °F)		
• EPDM	-10 ... +70 °C (14 ... +158 °F)		
EMC	89/336 EEC		
Design			
Weight	See dimensional drawings		
Material			
• Housing and flanges	Carbon steel, St 37.2		
• Terminal box	Standard Fibre glass reinforced polyamide		
• Measuring pipe	AISI 304 (1.4301)		
• Liner	NBR Hard Rubber (hydro carbon resistant) EPDM		
• Electrodes	Hastelloy C276		
• Grounding electrodes standard	Hastelloy C276		
Certificates and approvals			
Custody Transfer (only together with MAG 5000/6000 CT), order as special	OIML R 49 pattern approval cold water (Denmark and Germany): DN 50 ... 300 (2" ... 12") MI 001 cold water (EU): DN 50 ... 300 (2" ... 12")		
Approvals	CSA/FM Class 1, Div 2		
Drinking water approvals			
• EPDM	NSF61 (Cold water, US) WRAS (WRc, BS6920 cold water, GB) ACS listed (F), DVGW W270 (D) Belaqua (B)		
• NBR	NSF61 (Cold water, US)		
Approvals	PED – 97/23 EC ¹⁾ , CRN		

¹⁾ For sizes larger than 600 mm (24") in PN 16 PED conformity is available as a cost added option. The basic unit will carry the LVD (Low Voltage Directive) and EMC approval.

SITRANS F flowmeters

SITRANS F M

MAG 5100 W

Selection and Ordering data	Order No.
SITRANS F M Flowsensor MAG 5100 W	7ME6520-
Hastelloy electrodes, carbon steel flanges	1-2

Diameter

DN 25 (1")	2D
DN 40 (1½")	2R
DN 50 (2")	2Y
DN 65 (2½")	3F
DN 80 (3")	3M
DN 100 (4")	3T
DN 125 (5")	4B
DN 150 (6")	4H
DN 200 (8")	4P
DN 250 (10")	4V
DN 300 (12")	5D
DN 350 (14")	5K
DN 400 (16")	5R
DN 450 (18")	5Y
DN 500 (20")	6F
DN 600 (24")	6P
DN 700 (28")	6Y
DN 750 (30")	7D
DN 800 (32")	7H
DN 900 (36")	7M
DN 1000 (40")	7R
42"	7U
44"	7V
DN 1200 (48")	8B

Flange norm and pressure rating

to EN 1092-1

PN 10 (DN 200 ... 1200/8" ... 48")	B
PN 16 (DN 50 ... 1200/2" ... 48")	C
PN 16, non PED (DN 700 ... 1200/28" ... 48")	D
PN 40 (DN 25 ... 40/1" ... 1½")	F

to ANSI B16.5

class 150 (1" ... 24")

to AWWA C-207

Class D (28" ... 48")

to AS 4087

PN 16

Liner material

EPDM

NBR Hard Rubber

Transmitter

Sensor for remote transmitter (Order transmitter separately)

MAG 6000 I, Aluminum, 18 ... 90 V DC,
115 ... 230 V AC

MAG 6000, Polyamid, 11 ... 30 V DC/11 ... 24V AC

MAG 6000, Polyamid, 115/230 V AC

MAG 5000, Polyamid, 11 ... 30 V DC/11 ... 24V AC

MAG 5000, Polyamid, 115/230 V AC

Selection and Ordering data	Order No.
SITRANS F M Flowsensor MAG 5100 W	7ME6520-
Hastelloy electrodes, carbon steel flanges	1-2

Communication

None	A
HART	B
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)	F
PROFIBUS DP Profile 3 (only MAG 6000/MAG 6000 I)	G
MODBUS RTU/RS 485 (only MAG 6000/MAG 6000 I)	E
FOUNDATION Fieldbus H1 (only MAG 6000/MAG 6000 I)	J

Cable glands/terminal box

Metric	1
½" NPT	2

► Available ex stock

Selection and Ordering data	Order code
-----------------------------	------------

Additional information

Please add "-Z" to Order No. and specify Order code(s) and plain text.

Customer specific converter setup Y20

Tag name plate, stainless steel fixed with SS wire
(add plain text) Y17

Tag name plate, plastic (self adhesive) Y18

Factory certificate according to EN 10204-2.1 C15

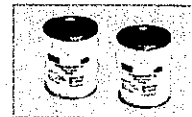
Factory certificate according to EN 10204-2.2 C14

Sensor cables wired (specify cable order no.) Y40

Sensor for remote transmitter's junction box potted to
IP68 with wired cable (specify cable order no.) Y41

Other postproduction requirements (add desired text) Y99

Description	Order No.
Potting kit for terminal box of SITRANS F M sensors for IP68/NEMA 6P (Not ATEX)	FDK-085U0220



MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place. MAG 6000 I transmitters and sensors are delivered compact mounted from factory. Communication module will be pre-mounted in the transmitter.

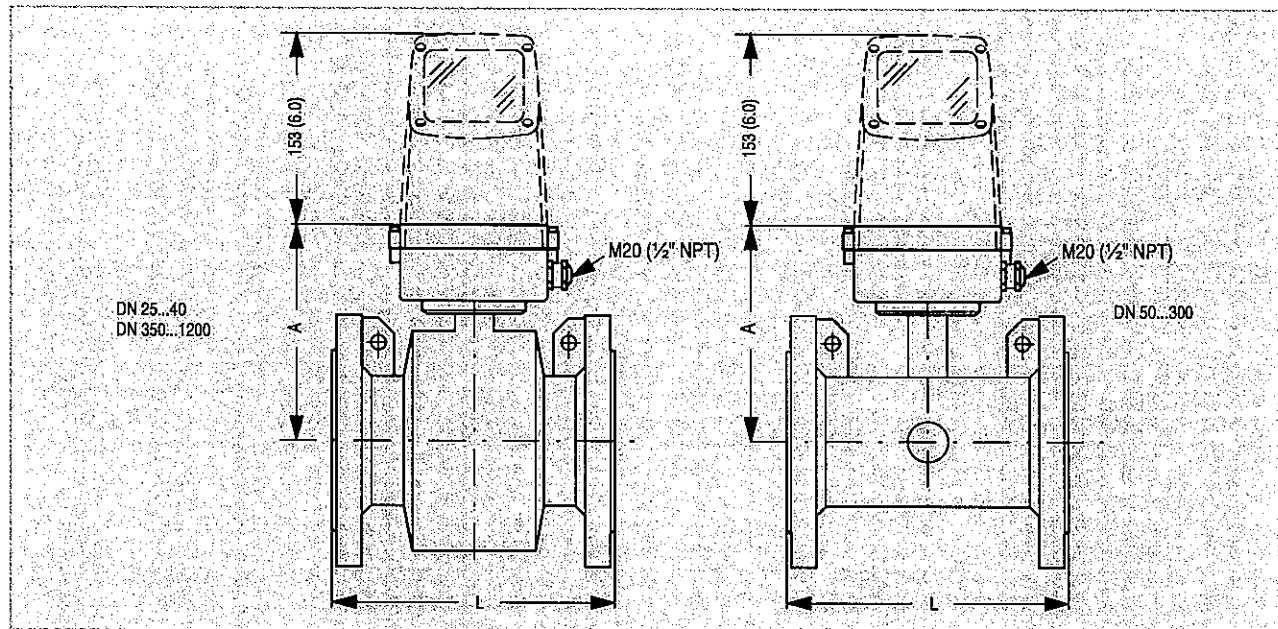
Please use online Product selector to get latest updates.

Product selector link:

www.pia-selector.automation.siemens.com

Please also see www.siemens.com/SITRANSForming
for practical examples of ordering

Dimensional drawings



4

Nominal size		A		L									
				PN 10		PN 16		PN 40		Class 150 / AWWA		AS	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
25	1	187	7.4	-	-	-	-	200	7.9	200	7.9	200	7.87
40	1½	197	7.8	-	-	-	-	200	7.9	200	7.9	200	7.87
50	2	188	7.4	-	-	200	7.9	-	-	200	7.9	200	7.87
65	2½	194	7.6	-	-	200	7.9	-	-	200	7.9	200	7.87
80	3	200	7.9	-	-	200	7.9	-	-	200	7.9	200	7.87
100	4	207	8.1	-	-	250	9.8	-	-	250	9.8	250	9.84
125	5	217	8.5	-	-	250	9.8	-	-	250	9.8	250	9.84
150	6	232	9.1	-	-	300	11.8	-	-	300	11.8	300	11.81
200	8	257	10.1	350	13.8	350	13.8	-	-	350	13.8	350	13.78
250	10	284	11.2	450	17.7	450	17.7	-	-	450	17.7	450	17.72
300	12	310	12.2	500	19.7	500	19.7	-	-	500	19.7	500	19.69
350	14	382	15.0	550	21.7	550	21.7	-	-	550	21.7	550	21.65
400	16	407	16.0	600	23.6	600	23.6	-	-	600	23.6	600	23.62
450	18	438	17.2	600	23.6	600	23.6	-	-	600	23.6	600	23.62
500	20	463	18.2	600	23.6	600	23.6	-	-	600	23.6	600	23.6
600	24	514	20.2	600	23.6	600	23.6	-	-	600	23.6	600	23.6
700	28	564	22.2	700	27.6	700	27.6	-	-	700	27.6	700	27.6
750	30	591	23.3	-	-	-	-	-	-	750	29.5	750	-
800	32	616	24.3	800	31.5	800	31.5	-	-	800	31.5	800	31.5
900	36	663	26.1	900	35.4	900	35.4	-	-	900	35.4	900	35.4
1000	40	714	28.1	1000	39.4	1000	39.4	-	-	1000	39.4	1000	39.4
	42	714	28.1	-	-	-	-	-	-	1000	39.4	-	-
	44	765	30.1	-	-	-	-	-	-	1100	43.3	-	-
1200	48	820	32.3	1200	47.2	1200	47.2	-	-	1200	47.2	1200	47.2

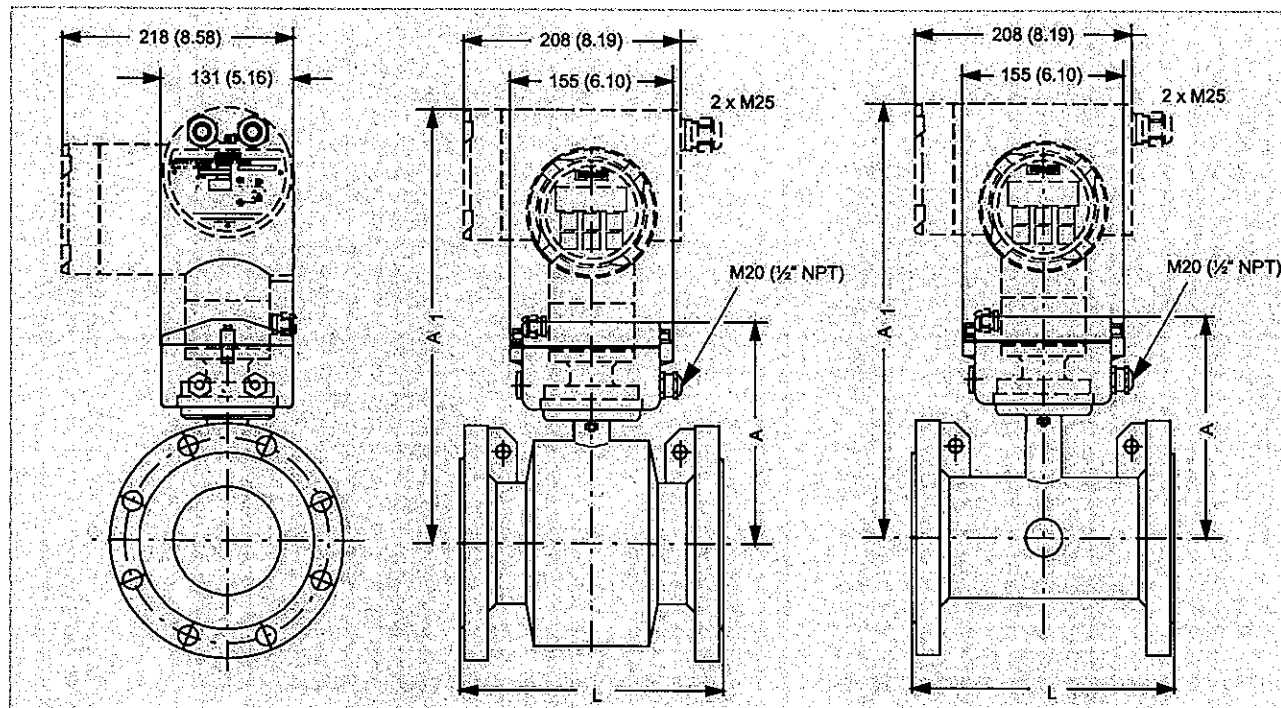
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SITRANS F flowmeters

SITRANS F M

MAG 5100 W

MAG 5100 W / 6000 I Compact



Nominal size		A		A ₁		L									
						PN 10		PN 16		PN 40		Class 150/AWWA		AS	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
25	1	187	7.4	340	13.4	-	-	-	-	200	7.9	200	7.9	200	7.87
40	1½	197	7.8	350	13.8	-	-	-	-	200	7.9	200	7.9	200	7.87
50	2	188	7.4	341	13.4	-	-	200	7.9	-	-	200	7.9	200	7.87
65	2½	194	7.6	347	13.7	-	-	200	7.9	-	-	200	7.9	200	7.87
80	3	200	7.9	353	13.9	-	-	200	7.9	-	-	200	7.9	200	7.87
100	4	207	8.1	360	14.2	-	-	250	9.8	-	-	250	9.8	250	9.84
125	5	217	8.5	370	14.6	-	-	250	9.8	-	-	250	9.8	250	9.84
150	6	232	9.1	385	15.2	-	-	300	11.8	-	-	300	11.8	300	11.81
200	8	257	10.1	410	16.1	350	13.8	350	13.8	-	-	350	13.8	350	13.78
250	10	284	11.2	437	17.2	450	17.7	450	17.7	-	-	450	17.7	450	17.72
300	12	310	12.2	463	18.2	500	19.7	500	19.7	-	-	500	19.7	500	19.69
350	14	382	15.0	535	21.1	550	21.7	550	21.7	-	-	550	21.7	550	21.65
400	16	407	16.0	560	22.1	600	23.6	600	23.6	-	-	600	23.6	600	23.62
450	18	438	17.2	591	23.3	600	23.6	600	23.6	-	-	600	23.6	600	23.62
500	20	463	18.2	616	24.3	600	23.6	600	23.6	-	-	600	23.6	600	23.6
600	24	514	20.2	667	26.3	600	23.6	600	23.6	-	-	600	23.6	600	23.6
700	28	564	22.2	717	28.2	700	27.6	700	27.6	-	-	700	27.6	700	27.6
750	30	591	23.3	744	29.3	-	-	-	-	-	-	750	29.5	750	-
800	32	616	24.3	779	30.7	800	31.5	800	31.5	-	-	800	31.5	800	31.5
900	36	663	26.1	826	32.5	900	35.4	900	35.4	-	-	900	35.4	900	35.4
1000	40	714	28.1	877	34.5	1000	39.4	1000	39.4	-	-	1000	39.4	1000	39.4
	42	714	28.1	877	34.5	-	-	-	-	-	-	1000	39.4	-	-
	44	765	30.1	928	36.5	-	-	-	-	-	-	1100	43.3	-	-
1200	48	820	32.3	983	38.7	1200	47.2	1200	47.2	-	-	1200	47.2	1200	47.2

- not available

SITRANS F flowmeters

SITRANS F M

MAG 5100 W

Weight

Nominal size		PN 10		PN 16		PN 40		Class 150/AWWA		AS	
[mm]	[inch]	[kg]	[lbs]	[kg]	[lbs]	[kg]	[lbs]	[kg]	[lbs]	[kg]	[lbs]
25	1	-	-	-	-	4	9	4	9	4	9
40	1½	-	-	-	-	7	15	6	13	7	15
50	2	-	-	9	20	-	-	8	20	9	20
65	2½	-	-	10.7	24	-	-	11	24	10.7	24
80	3	-	-	11.6	26	-	-	13	28	11.6	26
100	4	-	-	15.2	33	-	-	19	41	15.2	33
125	5	-	-	20.4	45	-	-	24	52	20.4	45
150	6	-	-	26	57	-	-	29	64	26	57
200	8	48	106	48	106	-	-	56	124	48	106
250	10	64	141	69	152	-	-	79	174	69	152
300	12	76	167	86	189	-	-	110	243	86	189
350	14	104	229	125	274	-	-	139	307	115	254
400	16	119	263	143	314	-	-	159	351	125	277
450	18	136	299	173	381	-	-	182	400	141	311
500	20	163	359	223	491	-	-	225	495	189	418
600	24	236	519	338	744	-	-	320	704	301	664
700	28	270	595	314	692	-	-	273	602	320	704
750	30	-	-	-	-	-	-	329	725	-	-
800	32	346	763	396	873	-	-	365	804	428	944
900	36	432	951	474	1043	-	-	495	1089	619	1362
1000	40	513	1130	600	1321	-	-	583	1282	636	1399
	42	-	-	-	-	-	-	687	1512	-	-
	44	-	-	-	-	-	-	763	1680	-	-
1200	48	643	1415	885	1948	-	-	861	1896	813	1789

- not available

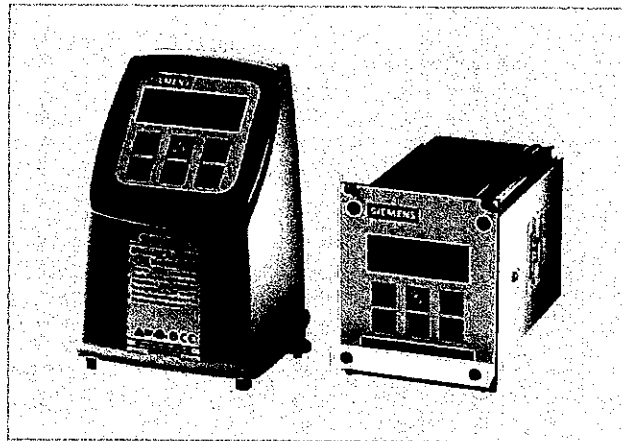
With transmitter MAG 5000 and MAG 6000 compact, weight is increased by approximately 0.8 kg (1.8 lbs), with MAG 6000 I, weight is increased by 5.5 kg (12.1 lb).

SITRANS F flowmeters

SITRANS F M

Transmitter MAG 5000/6000

Overview



Transmitter MAG 5000/6000 compact version (left) and 19" insert version (right)

The MAG 5000 and 6000 are microprocessor-based transmitters engineered for high performance, easy installation, commissioning and maintenance. The transmitters evaluate the signals from the SITRANS F M sensors type MAG 1100, MAG 1100 F, MAG 3100 and MAG 5100 W.

Transmitter types:

- MAG 5000: Max. measuring error 0.5% of rate (incl. sensor)
- MAG 6000: Max. measuring error 0.25% of rate (incl. sensor, see also sensor specifications) and with additional features such as: Plug & Play insert bus modules; integrated batch functions.

Benefits

- Superior signal resolution for optimum turn down ratio
- Digital signal processing with many possibilities
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection.
- 3 lines, 20 characters display in 11 languages.
- Flow rate in various units
- Totalizer for forward, reverse and net flow as well as additional information available
- Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self-diagnostic for error indication and error logging (see under SITRANS F M diagnostics)
- Batch control
- Custody transfer approval: PTB, OIML R75, R117, OIML R 49 and MI-001,
- MAG 6000 with add-on bus modules for HART, FOUNDATION Fieldbus H1, DeviceNet, MODBUS RTU/RS485, PROFIBUS PA and DP

Application

The SITRANS F M flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes and slurries. The main applications can be found in:

- Water and waste water
- Chemical and pharmaceutical industries
- Food & beverage industries
- Power generation and utility

Design

The transmitter is designed as either IP67 NEMA 4X enclosure for compact or wall mounting or 19" version as a 19" insert as a base to be used in:

- 19" rack systems
- Panel mounting IP65/NEMA 4
- Back of panel mounting IP20/NEMA 2
- Wall mounting IP66/NEMA 4

Several options on 19" versions are available such as:

- Transmitters mounted in safe area for Ex ATEX approved flow sensors (incl. barriers)
- Transmitters with electrode cleaning unit

Function

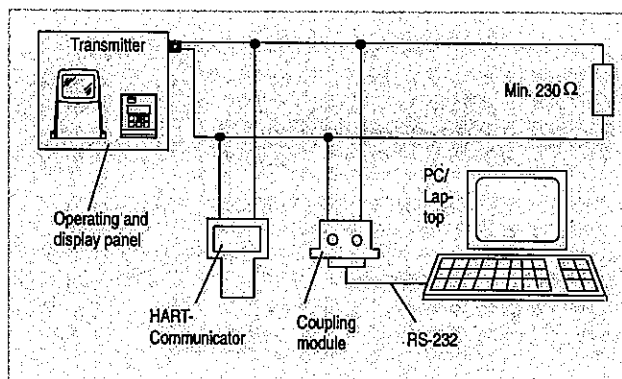
The MAG 5000/6000 are microprocessor-based transmitters with a build-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

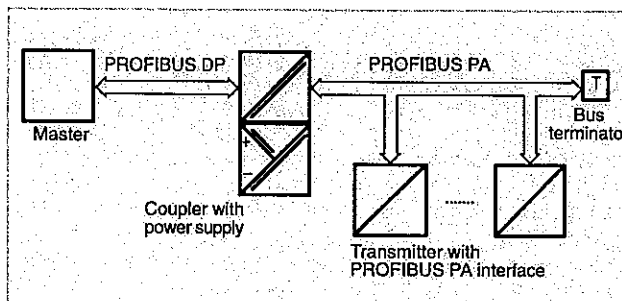
Displays and controls

Operation of the transmitter can be carried out using:

- Control and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS or MODBUS communication



HART communication



PROFIBUS PA communication

SITRANS F flowmeters

SITRANS F M

Transmitter MAG 5000/6000

Technical specifications

Mode of operation and design

Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (special cable required in remote mounted installation)
Excitation frequency	Depend on sensor size
Electrode input impedance	$> 1 \times 10^{14} \Omega$

Input

Digital input	11 ... 30 V DC, $R_i = 4.4 \text{ K}\Omega$
• Activation time	50 ms
• Current	$I_{DC 11 \text{ V}} = 2.5 \text{ mA}$, $I_{DC 30 \text{ V}} = 7 \text{ mA}$

Output

Current output	
• Signal range	0 ... 20 mA or 4 ... 20 mA
• Load	$< 800 \Omega$
• Time constant	0.1 ... 30 s, adjustable

Digital output

Frequency	0 ... 10 kHz, 50% duty cycle (uni/bidirectional)
Pulse (active)	DC 24 V, 30 mA, $1 \text{ K}\Omega \leq R_i \leq 10 \text{ K}\Omega$, short-circuit-protected (power supplied from flowmeter)
Pulse (passive)	DC 3 ... 30 V, max. 110 mA, $200 \Omega \leq R_i \leq 10 \text{ K}\Omega$ (powered from connected equipment)
Time constant	0.1 ... 30 s, adjustable

Relay output

Time constant	Changeover relay, same as current output
Load	42 V AC/2 A, 24 V DC/1 A
Low flow cut off	0 ... 9.9% of maximum flow
Galvanic isolation	All inputs and outputs are galvanically isolated

Max. measuring error (incl. sensor and zero point)

MAG 5000	0.5% of rate
MAG 6000	0.25% of rate

Rated operation conditions

Ambient temperature	
• Operation	- Display version: -20 ... +50 °C (-4 ... +122 °F) - Blind version: -20 ... +60 °C (-4 ... +140 °F)
• Storage	-40 ... +70 °C (-40 ... +158 °F)

Mechanical load

Compact version	18 ... 1000 Hz, 3.17 G rms, sinusoidal in all directions to IEC 68-2-36
19" insert	1 ... 800 Hz, 1 G, sinusoidal in all directions to IEC 68-2-36

Degree of protection

Compact version	IP67/NEMA 4X to IEC 529 and DIN 40050 (1 mH ₂ O 30 min.)
19" insert	IP20/NEMA 2 to IEC 529 and DIN 40050

EMC performance

EN 61326-1 (all environments)
EN 61326-2-5

Display and keypad

Totalizer	Two eight-digit counters for forward, net or reverse flow
Display	Background illumination with alphanumeric text, 3 x 20 characters to indicate flow rate, totalized values, settings and faults; Reverse flow indicated by negative sign
Time constant	Time constant as current output time constant

Design

Enclosure material	
• Compact version	Fiber glass reinforced polyamide; optional (IP67 only): AISI 316 stainless steel
• 19"-insert	Standard 19" insert of aluminium/steel (DIN 41494), width: 21 TE, height: 3 HE
• Back of panel	IP20/NEMA 2; Aluminium
• Panel mounting	IP65/NEMA 4; ABS plastic
• Wall mounting	IP66/NEMA 4; ABS plastic

Dimensional drawings

Compact version	See dimensional drawings
19" insert	See dimensional drawings

Weight

Compact version	0.75 kg (2 lb)
19" insert	See dimensional drawings

Power supply

- 115 ... 230 V AC +10% -15%, 50 ... 60 Hz, 17 VA
- 11 ... 30 V DC or 11 ... 24 V AC

Power consumption

- 230 V AC: 17 VA
- 24 V AC: 9 W, $I_N = 380 \text{ mA}$, $I_{ST} = 8 \text{ A}$ (30 ms)
- 12 V DC: 11 W, $I_N = 920 \text{ mA}$, $I_{ST} = 4 \text{ A}$ (250 ms)

Certificates and approvals

CE, ULc general purpose, C-tick; CSA/FM Class 1, div 2

Custody transfer approval (MAG 5000/6000 CT)

- PTB OIML R49 (cold water pattern approval); MI-001
- PTB and DANAK OIML R75 (hot water pattern approval) (MAG 6000 CT)
- PTB and DANAK OIML R117 (cold water/milk, beer etc. pattern approval) (MAG 6000 CT)

Communication

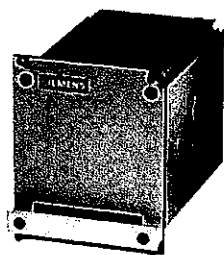
Standard	
• MAG 5000	Without serial communication or HART as option
• MAG 6000	Prepared for client mounted add-on modules
Optional (MAG 6000 only)	HART, MODBUS RTU/RS485, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA, PROFIBUS DP as add-on modules
• MAG 5000/6000 CT	no communication modules approved

SITRANS F flowmeters

SITRANS F M

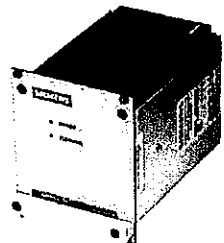
Transmitter MAG 5000/6000

Safety barrier (e/ia)



Application	For use with MAG 5000/6000 19" and MAG 1100 Ex ATEX/MAG 3100 Ex ATEX		
Ex approval	MAG 1100 Ex [EEx e ia] IIB ATEX MAG 3100 Ex [EEx e ia] IIC ATEX		
Cable parameter	Group	Capacity in μF	Inductance in mH
• Electrode	IIC	≤ 4.1	≤ 80
	IIB	≤ 45	≤ 87
	IIA	≤ 45	≤ 87
Ambient temperature			
• During operation	-20 ... +50 °C (-4 ... +122 °F)		
• During storage	-20 ... +70 °C (-4 ... +158 °F)		
Enclosure			
• Material	Standard 19" insert in aluminium/steel (DIN 41494)		
• Width	21 TE (4.75")		
• Height	3 HE (5.25")		
• Rating	IP20 / NEMA 2 to EN 60529 and DIN 40050		
• Mechanical load	1 g, 1 ... 800 Hz sinusoidal in all directions to EN 60068-2-36		
EMC performance			
• Emission	EN 50081-1 (Light industry)		
• Immunity	EN 50082-2 (Industry)		

Electrode cleaning unit



Application	For use with transmitters MAG 5000 and 6000 19" to clean the electrodes on sensors MAG 1100 or MAG 3100		
	NB: Must not be used with intrinsically safe ATEX sensors NB: Not to be used with sensors with Hastelloy and Tantalum electrodes		
Cleaning voltage			
AC cleaning	60 V AC		
DC cleaning	30 V DC		
Cleaning period	60 s + 60 s pause period		
Relay			
• Load	42 V/2 A		
Operation	Switch relay activated when cleaning is in progress		
• Automatic	Yes		
• Manual	No		
Indicator lamps	LEDs: "ON" and "CLEANING"		
Supply voltage and power consumption	115 ... 230 V AC, +10% ... -15%, 50 ... 60 Hz, 7 VA cleaning, 5 VA stand by 11 ... 30 V DC / 11 ... 24 V AC, 50 ... 60 Hz, 7 VA cleaning, 5 VA stand by		
Ambient temperature			
• During operation	-20 ... +50 °C (-4 ... +122 °F)		
• During storage	-20 ... +70 °C (-4 ... +158 °F)		
Enclosure			
• Material	Standard 19" insert in aluminium/steel (DIN 41494)		
• Width	21 TE (4.75")		
• Height	3 HE (5.25")		
• Rating	IP20 / NEMA 2 to EN 60529 and DIN 40050		
• Mechanical load	1 g, 1 ... 800 Hz sinusoidal in all directions to EN 60068-2-36		

Cleaning unit

The Siemens cleaning unit can be used with MAG 5000 or 6000 in 19" insert version.

The cleaning unit can be used in applications where the liner and subsequently the electrodes may be coated with deposits. If the coating is electrically insulating, the electrode signal will be reduced. If the coating is electrically inductive, the electrode signal will be partly short-circuited and in both cases the accuracy of the meter will decrease (dependent on coating type and thickness).

Note:

The cleaning unit cannot be used for inflammable or explosive media!

Mode of operation

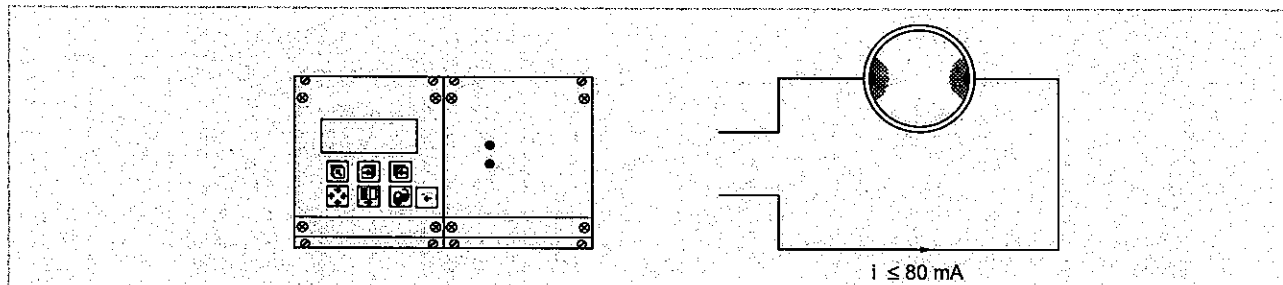
The cleaning unit cleans the electrodes electro-chemically by applying a voltage to the electrodes for approx. 60 seconds. While cleaning, the transmitter stores and holds the latest measured flow reading on the display and also the signal outputs. After an additional pausing period of 60 seconds the flowmeter resumes normal measurement and the cleaning is now completed.

The relay in the transmitter activates the cleaning cycle. In the relay output menu (under cleaning) the cleaning interval can be set between 1 hour and 24 hours.

Cleaning should only take place with liquid in the pipe. This can be detected via the empty pipe function. It is therefore recommended to select "empty pipe detection" ON when using the cleaning.

The cleaning sequence can also be controlled manually through the electrical input of the transmitter. Before this is done, ensure that the measuring pipe is full.

AC cleaning

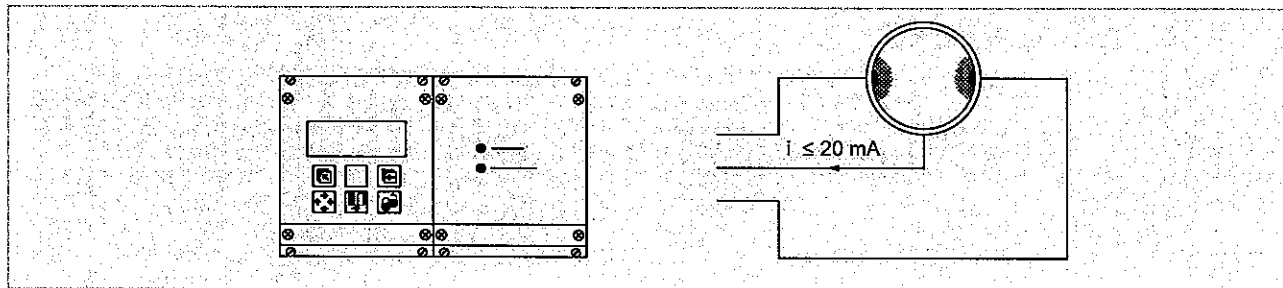


AC-cleaning is used to remove fatty deposits on the electrodes. These fatty deposits are seen in waste water applications, in abattoirs and water applications with oil residuals. During the cleaning process, the surface of the electrodes get warmer, which tends to soften grease particles and the gas bubbles generated mechanically lift deposits away from the surface of the electrodes.

Note:

Do not use AC-cleaning on sensors with Tantalum or Hastelloy electrodes.

DC cleaning



DC-cleaning is used to eliminate electrically conductive deposits in the measuring pipe influencing the measuring accuracy.

Particularly in district heating applications an electrically conductive deposit (magnetite) may occur and short-circuit the electrode signal. In this case the accuracy of the meter decreases and the signal/noise conditions of the meter become inferior. The problem only arises if the conductivity of the water is less than approx. $250 \mu\text{S/cm}$.

During DC-cleaning electrolysis takes place where the flow of electrons removes the particle deposits from the electrode area.

Note:

Do not use DC-cleaning on sensors with Tantalum or Hastelloy electrodes.

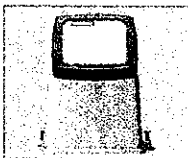
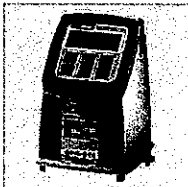
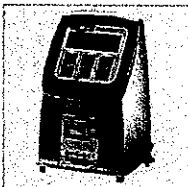
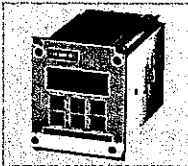
SITRANS F flowmeters

SITRANS F M

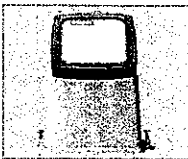
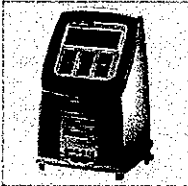
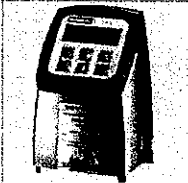
Transmitter MAG 5000/6000

Selection and Ordering Data

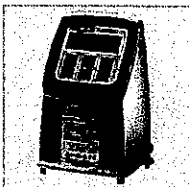
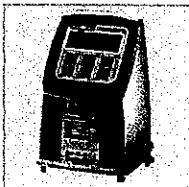
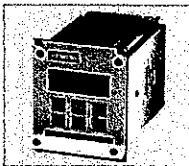
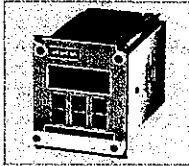
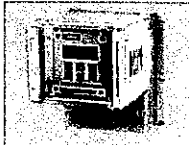
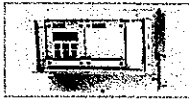
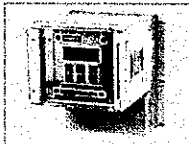
Transmitter MAG 5000

Description	Order No.	
Transmitter MAG 5000 Blind for compact and wall mounting; IP67/NEMA 4X, fibre-glass reinforced polyamide		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6910-1AA30-0AA0	
• 115/230 V AC, 50/60 Hz	7ME6910-1AA10-0AA0	
Transmitter MAG 5000 Display for compact and wall mounting; IP67/NEMA 4X, fibre-glass reinforced polyamide		
• 11 ... 30 V DC / 11 ... 24 V AC	▶ 7ME6910-1AA30-1AA0	
• 115/230 V AC, 50/60 Hz	▶ 7ME6910-1AA10-1AA0	
• 115/230 V AC, 50/60 Hz, with HART	7ME6910-1AA10-1BA0	
Transmitter MAG 5000 CT for compact and wall mounting, approved for custody transfer; IP67/NEMA 4X, fibre-glass reinforced polyamide		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6910-1AA30-1AB0	
• 115/230 V AC, 50/60 Hz	7ME6910-1AA10-1AB0	
Transmitter MAG 5000 for 19" rack and wall mounting		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6910-2CA30-1AA0	
• 115/230 V AC, 50/60 Hz	7ME6910-2CA10-1AA0	

Transmitter MAG 6000

Description	Order No.	
Transmitter MAG 6000 Blind for compact and wall mounting; IP67/NEMA 4X, fibre-glass reinforced polyamide		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6920-1AA30-0AA0	
• 115/230 V AC, 50/60 Hz	7ME6920-1AA10-0AA0	
Transmitter MAG 6000 for compact and wall mounting;		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6920-1AA30-1AA0	
• 115/230 V AC, 50/60 Hz	7ME6920-1AA10-1AA0	
IP67/NEMA 4X, AISI 316 stainless steel (only for sensor with SS terminal box)		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6920-1QA30-1AA0	
• 115/230 V AC, 50/60 Hz	7ME6920-1QA10-1AA0	

▶ Available ex stock

Description	Order No.	
Transmitter MAG 6000 CT for compact and wall mounting, approved for custody transfer (no communication modules possible); IP67/NEMA 4X, fibre-glass reinforced polyamide		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6920-1AA30-1AB0	
• 115/230 V AC, 50/60 Hz	7ME6920-1AA10-1AB0	
Transmitter MAG 6000 SV for compact and wall mounting; special excitation 44 Hz settings for Batch application DN ≤ 25/1" IP67/NEMA 4X, fibre-glass reinforced polyamide		
11 ... 30 V DC / 11 ... 24 V AC	7ME6920-1AB30-1AA0	
115/230 V AC, 50/60 Hz	7ME6920-1AB10-1AA0	
Transmitter MAG 6000 for 19" rack and wall mounting		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6920-2CA30-1AA0	
• 115/230 V AC, 50/60 Hz	7ME6920-2CA10-1AA0	
Transmitter MAG 6000 SV for 19" rack and wall mounting; special excitation 44 Hz settings for Batch application DN ≤ 25/1"		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6920-2CB30-1AA0	
• 115/230 V AC, 50/60 Hz	7ME6920-2CB10-1AA0	
MAG 6000 with IP66/NEMA 4X enclosure; 115/230 V AC, 50/60 Hz	7ME6920-2EA10-1AA0	
MAG 6000 with electrode cleaning unit, complete mounted with IP66/NEMA 4X mounting enclosure		
• 11 ... 30 V DC / 11 ... 24 V AC	7ME6920-2PA30-1AA0	
• 115/230 V AC, 50/60 Hz	7ME6920-2PA10-1AA0	
MAG 6000 with safety barrier for ATEX 2G D approved sensors, complete mounted with IP66/NEMA 4X wall mounting enclosure, ATEX, 115/230 V AC, 50/60 Hz		
• For ATEX 2G D sensors	7ME6920-2MA11-1AA0	
MAG 6000 SV, 19" insert, in IP66/NEMA 4X, ABS plastic enclosure, excitation frequency 44 Hz for Batch application DN ≤ 25/1", 11 ... 30 V DC, 11 ... 24 V AC, 50/60 Hz	7ME6920-2EB30-1AA0	

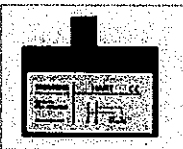
SITRANS F flowmeters

SITRANS F M

Transmitter MAG 5000/6000

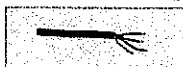
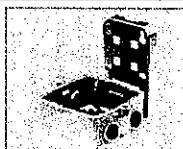
Communication modules for MAG 6000

Description	Order No.
HART (not for MAG 6000 I)	► FDK-085U0226
MODBUS RTU/RS485	► FDK-085U0234
PROFIBUS PA Profile 3	► FDK-085U0236
PROFIBUS DP Profile 3	► FDK-085U0237
DeviceNet	► FDK-085U0229
FOUNDATION Fieldbus H1	► A5E02054250



Accessories for MAG 5000 and MAG 6000

Description	Order No.
Wall mounting unit for IP67/NEMA 4X version, wall bracket, terminal box in polyamide	
• 4 x M20 cable glands	► FDK-085U1018
• 4 x 1/2" NPT cable glands	► FDK-085U1053
Cable for standard electrode or coil, 3 x 1.5 mm ² / 18 gage with shield PVC	
• 10 m (33 ft)	► FDK-083F0121
• 20 m (65 ft)	► FDK-083F0210
• 40 m (130 ft)	► FDK-083F0211
• 60 m (200 ft)	► FDK-083F0212
• 100 m (330 ft)	FDK-083F0213
• 150 m (500 ft)	FDK-083F3052
• 200 m (650 ft)	FDK-083F3053
• 500 m (1650 ft)	FDK-083F3054
Electrode cable for empty pipe or low conductivity, double shielded, 3 x 0.25 mm ²	
• 10 m (33 ft)	FDK-083F3020 ^{D)}
• 20 m (65 ft)	► FDK-083F3095 ^{D)}
• 40 m (131 ft)	FDK-083F3094 ^{D)}
• 60 m (200 ft)	FDK-083F3093 ^{D)}
• 100 m (330 ft)	FDK-083F3092 ^{D)}
• 150 m (500 ft)	FDK-083F3056 ^{D)}
• 200 m (650 ft)	FDK-083F3057 ^{D)}
• 500 m (1650 ft)	FDK-083F3058 ^{D)}
Cable kit with standard coil cable, 3 x 1.5 mm ² /18 gage with shield PVC and electrode cable double shielded, 3 x 0.25 mm ²	
• 10 m (33 ft)	A5E01181647 ^{F)}
• 20 m (65 ft)	A5E01181656 ^{F)}
• 40 m (130 ft)	A5E01181686 ^{F)}
• 60 m (200 ft)	A5E01181689 ^{F)}
• 100 m (330 ft)	A5E01181691 ^{F)}
• 150 m (500 ft)	A5E01181699 ^{F)}
• 200 m (650 ft)	A5E01181703 ^{F)}
• 500 m (1640 ft)	A5E01181705 ^{F)}



Description	Order No.
Cable glands, for above cable, 2 pcs.	
• M20	A5E00822490
• 1/2" NPT	A5E00822501
Sealing screws for sensor/transmitter, 2 pcs	FDK-085U0221
Terminal box, in polyamide, inclusive lid	
• M20	► FDK-085U1050
• 1/2" NPT	FDK-085U1052
Terminal box lid, in polyamid	FDK-085U1003
Terminal box for MAG 6000, in stainless steel, inclusive lid	
• M20	A5E00836867
• 1/2" NPT	A5E00836868
Terminal box (3A) for MAG 1100 Food in polyamide, inclusive lid	
• M20	A5E00822478
• 1/2" NPT	A5E00822479
Potting kit for terminal box of MAG sensors for IP68/NEMA 6P (not ATEX)	► FDK-085U0220
19" cleaning unit for electrode cleaning (21TE) incl. back plate	
• 11 ... 30 V DC / 11 ... 24 V AC	FDK-083F5039
• 115 ... 230 V AC, 50/60 Hz	FDK-083F5036
19" safety barrier (21 TE) [EEx e ia] IIC for MAG 1100 ATEX and MAG 3100 ATEX, incl. back plate	FDK-083F5034
Panel mounting enclosure for 19" insert (21 TE); IP65/NEMA 4 enclosure in ABS plastic for front panel mounting	FDK-083F5030
Panel mounting enclosure for 19" insert (42 TE); IP65/NEMA 4 enclosure in ABS plastic for front panel mounting	FDK-083F5031
Back of panel mounting enclosure for 19" insert (21 TE); IP20/NEMA 2 enclosure in aluminium	FDK-083F5032

► Available ex stock

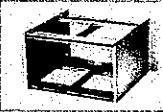
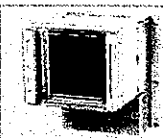
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F) Subject to export regulations AL: 91999, ECCN: N.

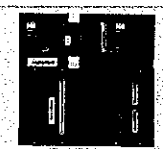
SITRANS F flowmeters

SITRANS F M

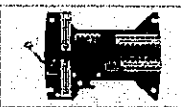
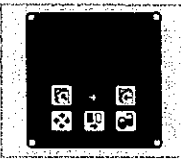
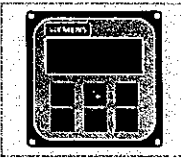
Transmitter MAG 5000/6000

Description	Order No.	
Back of panel mounting enclosure for 19" insert (42 TE); IP20/NEMA 2 enclosure in aluminium	FDK-083F5033	
IP66/NEMA 4, wall mounting enclosure for 19" inserts (without backplates)		
• 21 TE	FDK-083F5037	
• 42 TE	► FDK-083F5038	
Front cover (7TE)	FDK-083F4525	
► Available ex stock		

Back plates (if wall enclosure IP66 is used as part)

Description	Order No.	
Wall unit enclosure IP66, 12 ... 24 V, 115 ... 230 V		
• Transmitter	FDK-083F4121	
• Transmitter ia/e and safety barrier	FDK-083F4122	
• Transmitter ia/ib and safety barrier (only for sensors produced before October 2007)	FDK-083F4120	
• Transmitter and cleaning unit	FDK-083F4124	

Spare parts

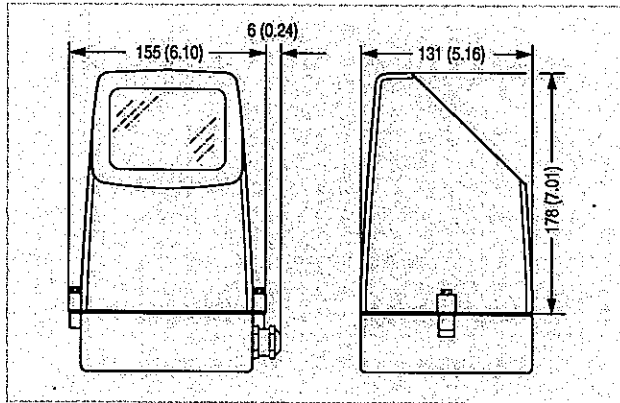
Description	Order No.	
Connection plate		
• 12 ... 24 V	FDK-083F4149	
• 115 ... 230 V	FDK-083F4148	
19" enclosure, 12 ... 24 V, 115 ... 230 V		
• Connection plate for standard 19" transmitter	FDK-083F4117	
• Connection plate for transmitter ia and safety barrier	FDK-083F4118	
• Connection plate for transmitter ia/ib and safety barrier (only for sensors produced before October 2007)	FDK-083F4119	
• Connection plate for transmitter and cleaning unit	FDK-083F4123	
SENSORPROM memory unit (Sensor code and serial numbers must be specified on order)		
• 2 kB (for MAG 5000/6000/MAG 6000 I)	FDK-085U1005	
• 250 B (for MAG 2500/3000)	FDK-085U1008	
Display unit for MAG 5000/6000		
• black neutral front	FDK-085U1038	
• Siemens front	FDK-085U1039	

Sun Shields for MAG 5000/6000 transmitters

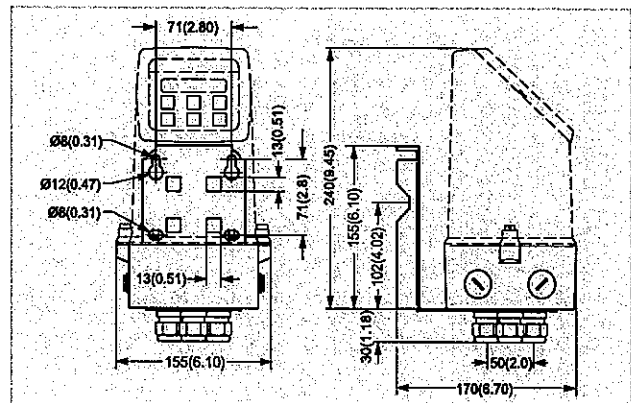
Description	Order No.	
Sun shield for remote MAG 5000/6000 transmitters	A5E01209496	
Sun Shield for compact MAG 5000/6000 transmitters on MAG 3100 (DN 15 ... 2000 (½" ... 78") or MAG 5100 (DN 150 ... 1200 (6" ... 48"))	A5E01209500	

Dimensional drawings

Transmitter IP67/NEMA 4X compact polyamide

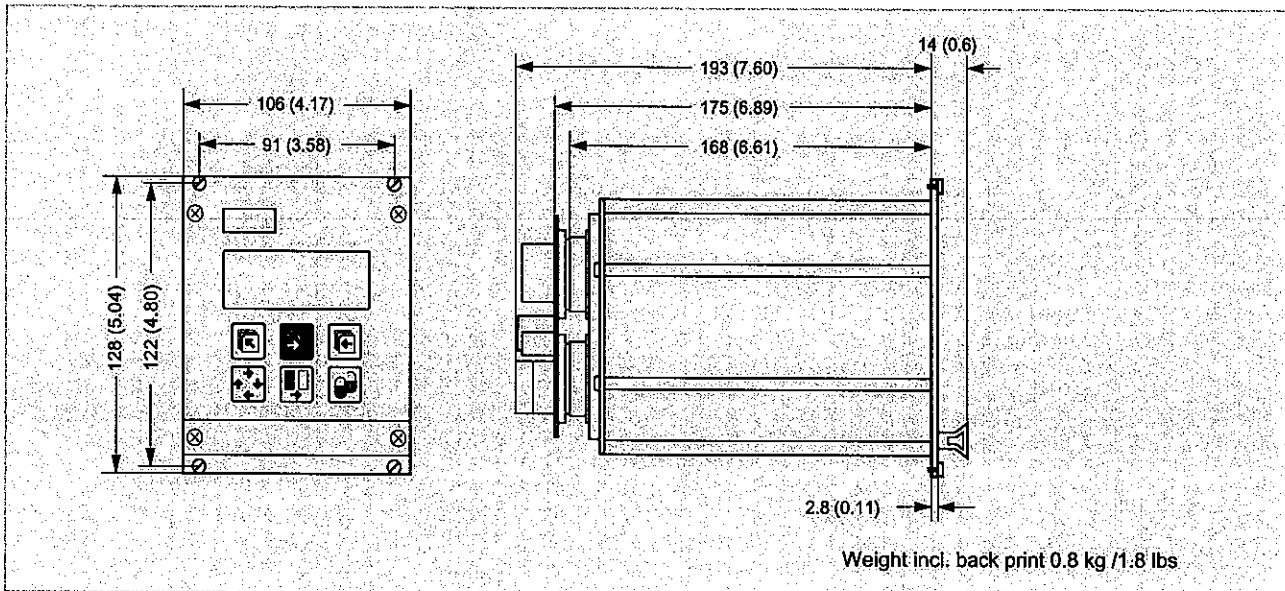


Transmitter compact mounted



Transmitter wall mounted

Transmitter, 19" IP20/ NEMA 2 standard unit

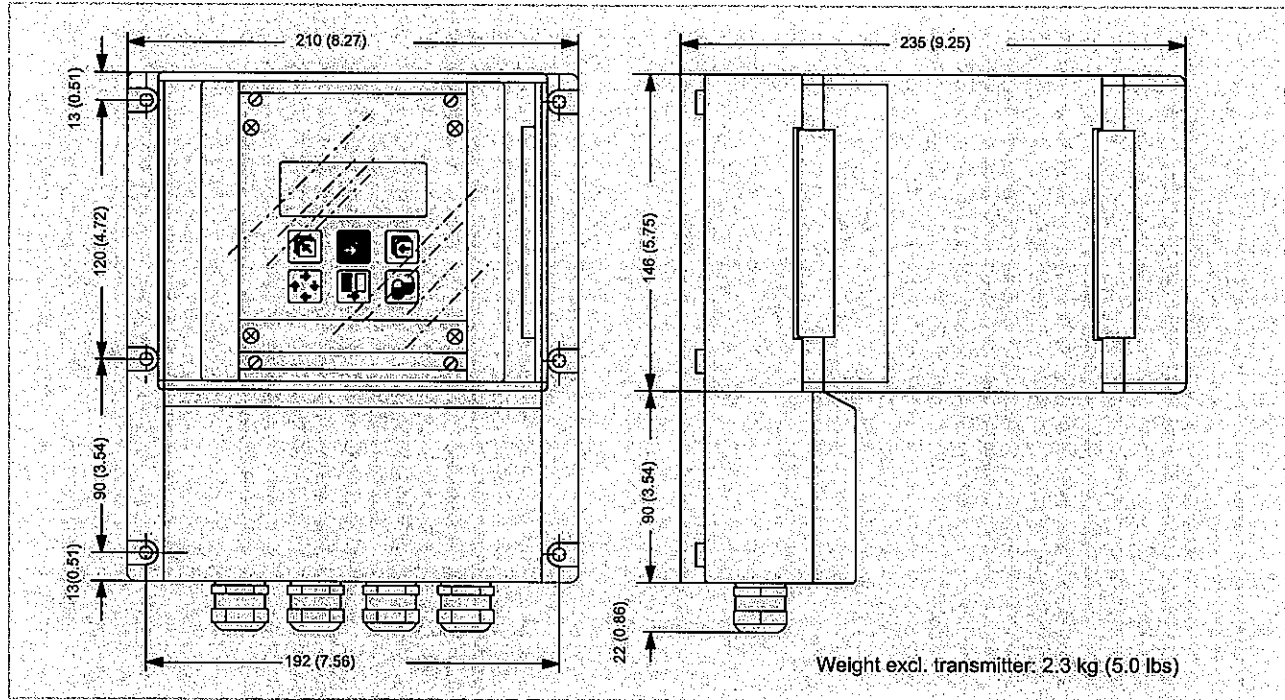


SITRANS F flowmeters

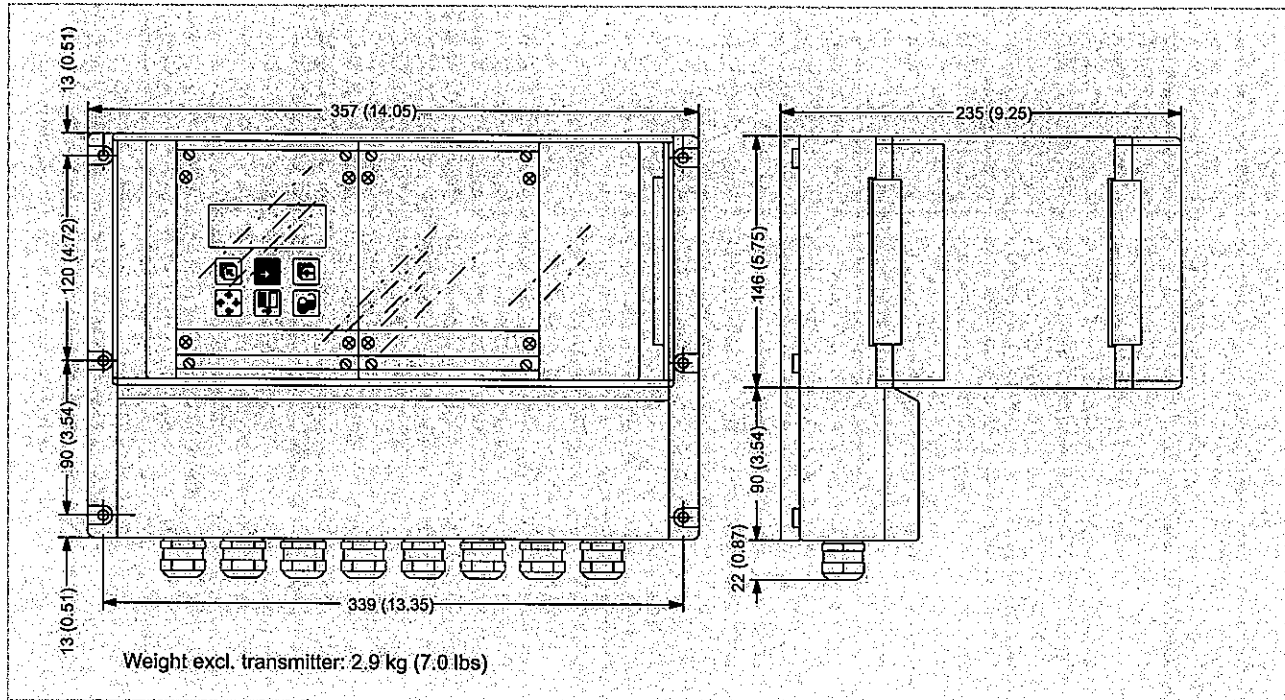
SITRANS F M

Transmitter MAG 5000/6000

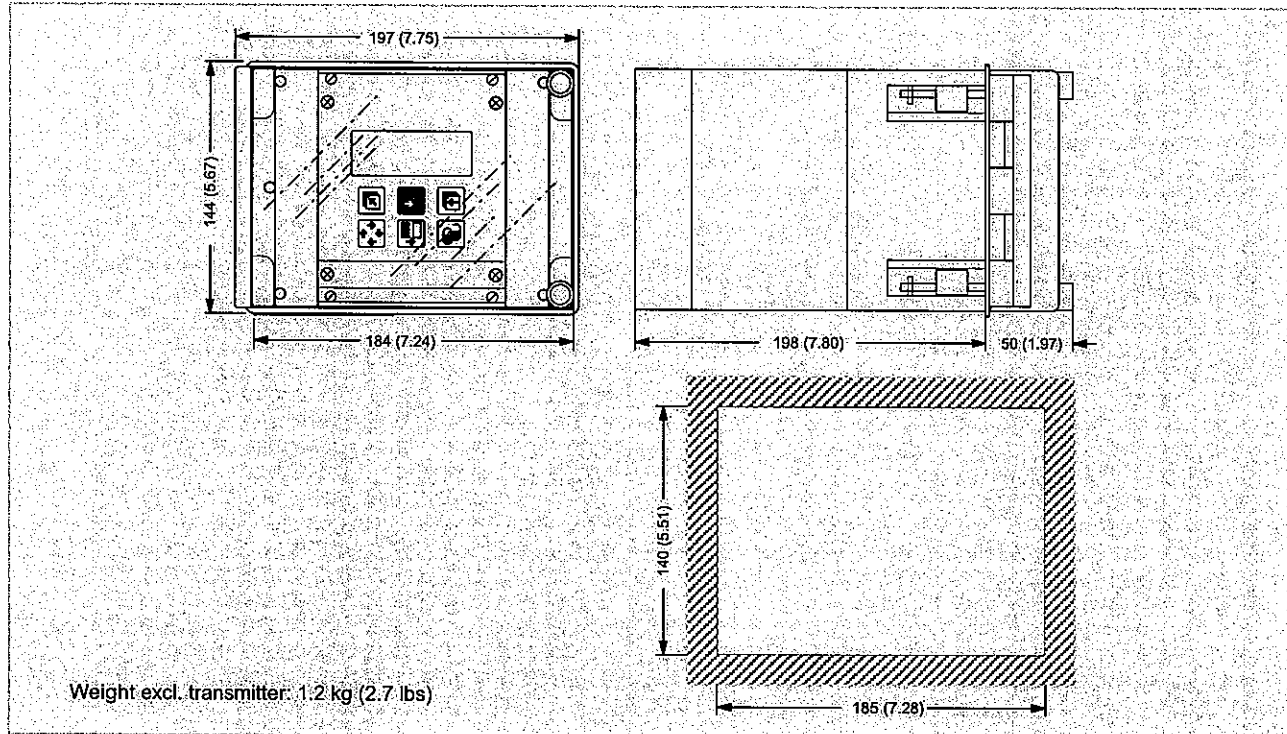
Transmitter, wall mounting IP66/NEMA 4, 21 TE



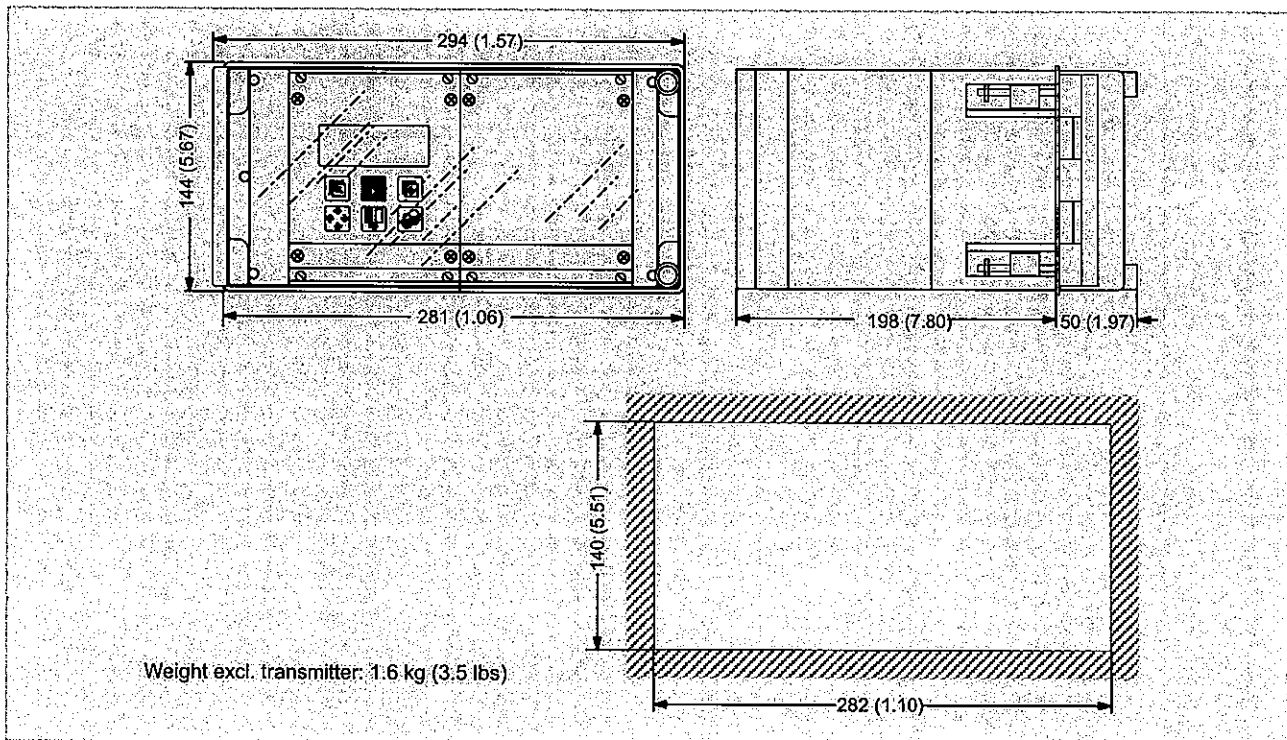
Transmitter, wall mounting IP66/NEMA 4, 42 TE



Transmitter, panel front IP65/NEMA 4, 21 TE



Transmitter, panel front IP65/NEMA 4, 42 TE

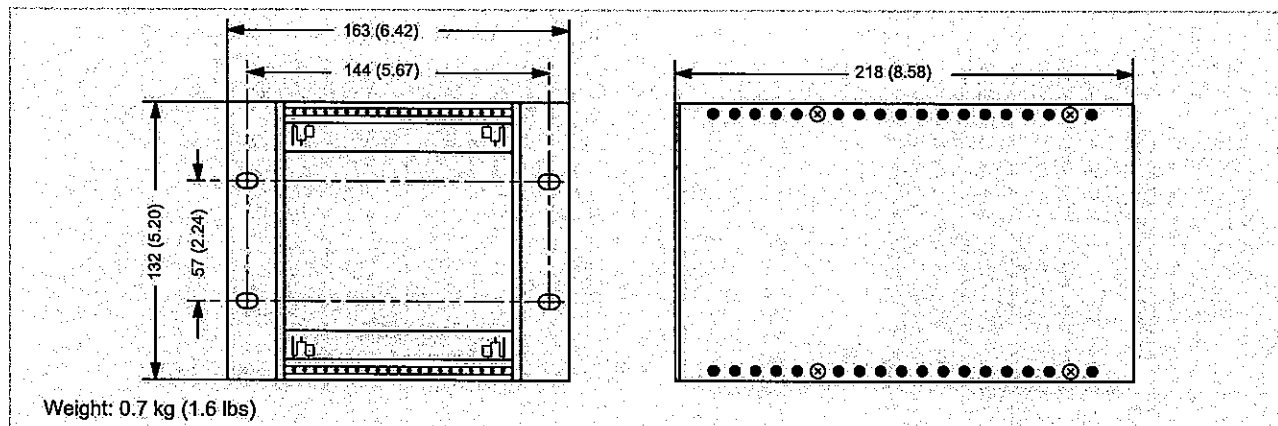


SITRANS F flowmeters

SITRANS F M

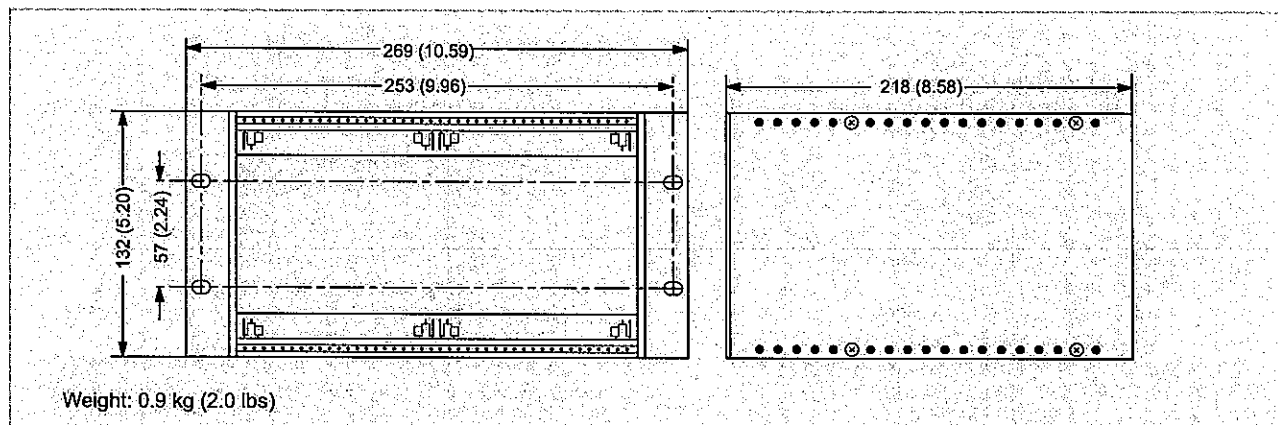
Transmitter MAG 5000/6000

Transmitter, back of panel IP20/NEMA 2, 21 TE



4

Transmitter, back of panel IP20/NEMA 2, 42 TE



Schematics

Electrical connection

Grounding

PE must be connected due to safety class 1 power supply.

Mechanical counters

When mounting a mechanical counter to terminals 57 and 58 (active output), a 1000 μ F capacitor must be connected to the terminals 56 and 58. Capacitor + is connected to terminal 56 and capacitor - to terminal 58.

Output cables

If the output cable length is long in noisy environment, we recommend to use screened cable.

