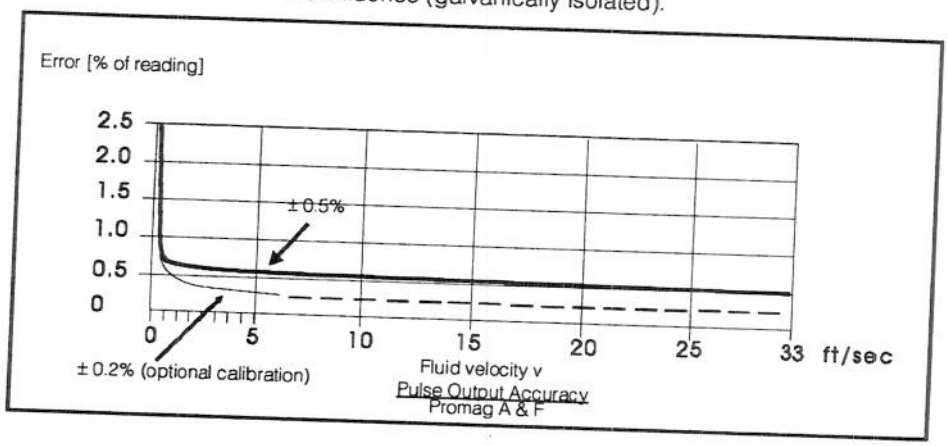
Technical Data

Error Limits

Measuring uncertainty under reference conditions

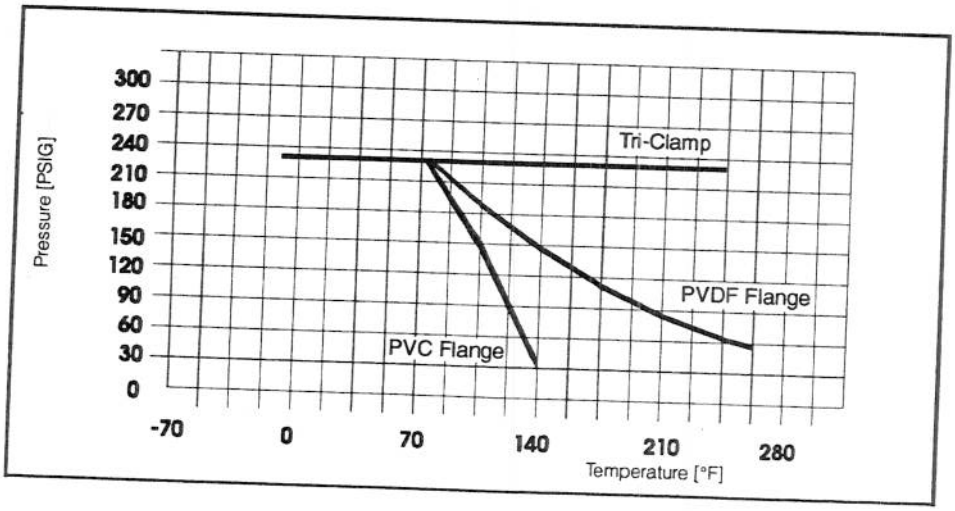
Pulse output	Promag 30/33/39 A, H, & F: +/- 0.5% of reading +/-0.01% of max. full scale (33 ft/s) Promag 30/33D: +/-0.7% of reading +/00.01 % of max. full scale (33 ft/s)
Current output	Same as pulse output accuracy plus: Promag 30 +/-10 µA; Promag 33/39 +/-5 µA
Repeatability	+/-0.1% of rate +/00.005 % of max full scale (33 ft/s)
Options	Promag 30/33/39 A, H, & F: +/- 0.2% of reading +/-0.05% of Qk (Qk = customer desired full scale flow rate for calibration, greater than 6 ft/s up to 33 ft/s) Promag 30/33 D: +/- 0.45% of reading +/-0.05% of Qk
Power supply voltage	within the specified range, supply fluctuations have no influence (galvanically isolated).



Promag 30/33/39 A
Process Connections

Pressure limitations due to fluid temperature

Bonding sleeve material:	PVC
Flange material:	PVDF
Tri-Clamp material:	316LSS



Technical Data

Measuring Sensor

	Promag A measuring sensor	Promag D measuring sensor	Promag F measuring sensor	Promag H measuring sensor
Diameter	$^1/_{12}$", $^5/_{32}$", $^5/_{16}$", $^1/_2$", 1"	1" - 4"	$^1/_2$" - 78"	1" - 4"
Maximum pressure	PVC or PVDF - see Pg. 29 580 PSIG SS threaded 230 PSIG for Tri-clamp Flanged per ANSI B16.5 Class 150	580 PSIG	Per ANSI B16.5: Class 150 ($^1/_2$" - 24") Class 300 option ($^1/_2$" - 6") Per AWWA: Class D (28" - 78")	230 PSIG
Process connection	external or internal thread, PVC sleeves, flexible tube fittings, weld nipple, Tri-Clamp, Flange connection (ANSI)	Wafer	Flange connection (ANSI B16.5)	Sanitary weld nipple or Tri-clamp: 3A Authorized: 316LSS
Flange material	ANSI: 316LSS, PVDF Thread adapter: 316LSS; PVC		A 105 carbon steel (standard) 316LSS	
Fluid temperature range and liner material[1]	-4 to +265 °F PFA	-40 to +300 °F PTFE -4 to +250 °F soft rubber +32 to +175 °F hard rubber	-40 to +265°F PTFE (1/2"-24") -40 to +300°F PTFE (for remote version (1/2"-24") -4 to +250°F Soft rubber EPDM (1/2"-78") 32 to +175°F Hard rubber (3"-78") 30 to +160°F Polyurethane (1"-12")	-4 to +300 °F PFA -4 to +265 °F with EPDM gaskets
Ambient temperature range	-4 to +140 °F	-4 to +140 °F	-4 to +140 °F	-4 to +140 °F
Electrode material[1]	316LSS (standard), Hastelloy C 22, platinum/rhodium 80/20, tantalum	Hastelloy C 22 (standard), 316LSS, platinum/rhodium 80/20, tantalum	Hastelloy C 22 (standard), 316LSS, platinum/rhodium 80/20, tantalum	316LSS
Fitted electrodes	measuring electrodes grounding electrode empty pipe detection electrode	measuring electrodes grounding electrode empty pipe detection electrode	measuring electrodes grounding electrode empty pipe detection electrode	measuring electrodes empty pipe detection electrode — grounding not required.
Minimum conductivity	5 µS/cm*	5 µS/cm*	5 µS/cm*	5 µS/cm*
Gasket material	Viton (standard), Kalrez, Silicone (sanitary version)	—	—	EPDM, Silicone
Housing material	316LSS incl. thread adapter (see also process connection dimensions)	Epoxy-painted steel (Option: 316LSS)	Epoxy coated die-cast aluminum	316LSS
Protection type	NEMA 4X (standard)	NEMA 4X (standard) submersible to 30 ft. for 48 hrs. (option)	NEMA 4X (standard) submersible varies by size	NEMA 4X (standard)
CIP cleanable (observe max. temperature)	yes	yes	yes	yes
SIP cleanable	—	—	—	yes
Power supply	The sensor is powered by the transmitter			
Cable entries (remote version)	$^1/_2$" NPT	$^1/_2$" NPT	$^1/_2$" NPT	$^1/_2$" NPT

[1] Endress + Hauser cannot guarantee the compatibility of wetted parts with any specific process fluid. The customer assumes responsibility and liability for the final choice of materials.

* 1 µS/cm fluids and slurries with high solids content can be measured using Promag 35S. See separate bulletin TI 035D/06/ae.

Technical Data

Promag 33
measuring transmitter

Housing material	epoxy coated die-cast aluminum
Electrical classification	FM approved non-incendive Class I, Division 2, Groups A-D; Dust ignition-proof, Class II, III, Division 1, Groups EF&G; CSA Class I, Division 2, Groups A-D; CSA Class I, Division I, Groups A-D
Protection type	NEMA 4X
Ambient temperature range	-4 to +140 °F
Shock and vibration immunity	acceleration to 2 g/2 h per day, 10 - 100 Hz (complete measuring system)
Cable entries	power supply cable and signal cable (outputs) $^1/_2$" NPT
Power supply	85 - 260 V AC, 45 - 65 Hz 16 - 62 V DC Power supply brownouts: bridges min. of 1 cycle (≤ 22 ms)
Power consumption	AC: <15 VA (incl. sensor) DC: <15 W (incl. sensor)
Galvanic isolation	inputs and outputs galvanically isolated from power supply (VDE 0160), from sensor and each other (U_{max} = 500 V)
Current output	0/4 - 20 mA settable, galvanically isolated, R_L <700 Ω, (with HART at least 250 Ω) selectable time constant, scaleable full scale value, temperature coefficient typ.: 0.005% o.r./°C
Pulse/frequency output	active/passive selectable, galvanically isolated, active: 24 V DC, 25 mA (250 mA/20 ms), R_L >100 Ω passive: open collector, 30 V DC, 25 mA (250 mA/20 ms) Frequency output: f_{End} = selectable to 10 kHz, duty cycle approx 50/50; pulse width max. 2 s Pulse output: selectable pulse value, selectable pulse polarity, setable pulse width (50 ms - 2 s) Above a frequency of 1/(2 x pulse width), the on/off ratio is 1:1.
Response time	See table below

	Pulse Freq Output	Analog Output
$^1/_{12}$"	.42 sec	.47 sec+*
$^5/_{32}$" - 4"	.33 sec	.38 sec+*
6" - 8"	.50 sec	.55 sec+*
10" - 16"	.67 sec	.72 sec+*
18" - 20"	.75 sec	.80 sec+*
24"	.83 sec	.88 sec+*
28" - 30"	1.0 sec	1.1 sec+*
32" - 36"	1.1 sec	1.2 sec+*
40" - 42"	1.3 sec	1.4 sec+*
48"	1.5 sec	1.6 sec+*

* Minimum response time - current output response time can be increased by adjusting time constant.

Alarm output	Relay 1, choice of opening or closing contacts available, max. 60 V AC/30 V DC, max. 0.5 A AC/0.1 A DC, galvanically isolated. Configurable for alarm, alarm + EPD, limit value 1, Empty Pipe Detection (EPD), overranging (v ≥ 41 ft/s), dual range mode, pre-batch contact or flow direction
Status output	Relay 2, choice of opening or closing contacts available, max. 60 V AC/30 V DC, max. 0.5 A AC/0.1 A DC, galvanically isolated. Configurable for limit value 2, dual range mode, batching contact, empty pipe detection, flow direction or overranging v ≥ 41 ft./s.
Auxiliary input	V= 3 to 30 V DC, pulse or level control, Ri = 1.8 kΩ, galvanically isolated. Can be configured for: Reset totalizer, activate batching cycle, dual range mode, positive zero return
Communication	SMART technology (HART protocol via current output) standard RS 485 interface (Rackbus protocol) optional
Data storage on power failure	EEPROM stores data of the measuring system (without batteries) on power failure
Display	LC display, illuminated, two-lines (16 characters each)
Electromagnetic immunity (EMI)	acc. to EN 50081 Part 1 and 2 / EN 50082 Part 1 and 2, and NAMUR recommendations (complete measuring system), CE approval
Totalizer	7 digit with capacity to count the number of times the totalizer rolls over (or overflows) (non-volatile, stored on power failure)

Ordering Information

Boldface items have standard delivery times

Ordering Code: Promag 30A

1	2	3	4	5	6	7	8	9	10	11	12	13

1 LINER MATERIAL

T Teflon (PFA)

2 Size

	in.	mm.	Full Scale GPM min.	max.
02	1/12	2	0.02	0.5
04	5/32	4	0.1	2.0
08	5/16	8	0.5	10.0
15	1/2	15	1.5	30
25	1	25	5	100

3 PROCESS CONNECTION/GASKET MATERIAL

Connections which require an additional process connection mounting set (see p. 46)

A 1" threads/316LSS, Viton gasket
B 1" threads/316LSS, Kalrez gasket
C 1" threads/316LSS, Silicone gasket - 3A sanitary
D 1" threads/PVC, Viton gasket
E 1" threads/PVC, Kalrez gasket
1 1" threads/316LSS, Viton gasket - 3A Sanitary
G Other

Connections which DO NOT require an additional process connection mounting set

H ANSI 150-lb. flange/316LSS, Viton gasket
K ANSI 150-lb. flange/316LSS, Kalrez gasket
L ANSI 300-lb. flange/316LSS, Viton gasket
M ANSI 300-lb. flange/316LSS, Kalrez gasket
R ANSI 150-lb. flange/PVDF, Viton gasket
S ANSI 150-lb. flange/PVDF, Kalrez gasket
2 1" Tri-Clamp, 316LSS, Silicone gasket
3 1" Tri-Clamp, 316LSS, Viton gasket
4 1/2" Tri-Clamp, 316LSS, Silicone gasket, for 1/12" - 5/16" only
5 1/2" Tri-Clamp, 316LSS, Viton gasket, for 1/12" - 5/16" only
6 3/4" Tri-Clamp, 316LSS, Silicone gasket, for 1/2" only
7 3/4" Tri-Clamp, 316LSS, Viton gasket, for 1/2" only
9 Other

4 ELECTRODES/MATERIALS

D 316LSS measuring/grounding/empty pipe detection electrodes (not for blind version)
H Hastelloy C-22 measuring/grounding/empty pipe detection electrodes (not for blind version)
N Tantalum measuring/grounding/empty pipe detection electrodes (not for blind version)
R Platinum/20% Rhodium measuring/grounding electrodes
T Platinum/20% Rhodium measuring/grounding/empty pipe detection electrodes (not for blind version)
9 Other

5 CERTIFICATES

1 Standard, without certificate
9 Other

6 PROTECTION TYPE/VERSION

E NEMA 4X compact version
F NEMA 4X remote version, FS
L NEMA 4X remote version, FL without EPD
9 Other

7 CABLE ENTRIES

D 1/2" NPT
9 Other

8 CABLE FOR REMOTE VERSION

1 Separate/compact version without cable
4 16.5-ft coil/signal cable with empty pipe detection, FS
5 33-ft coil/signal cable with empty pipe detection, FS
8 Coil/signal cable with empty pipe detection, FS, specify length in feet (max 656 ft (EPD max 33 ft))
B 33-ft coil/signal cable, FL (without empty pipe detection)
C Coil/signal cable, FL (without empty pipe detection) specify length in feet (max 656 ft)
9 Other

9 CALIBRATION

1 3-point standard calibration
2 5-point calibration
3 0.2% calibration
4 Bidirectional std. 3-point calibration
9 Other

10 APPROVALS

D FM approved NI - Class I, Div. 2, Groups ABCD; DIP - Class II, Div. 1, Groups EFG
E FM approved Class I, II & III, Div. I, Groups A-G (compact version only)
F CSA Class I, Div. 2, Groups ABCD
G CSA Class I, Div. 1, Groups ABCD (compact version only, up to 12")
O FM approved Class I, II & III, Div. 1, Groups A-G sensor for use with Class I, Div. 2 transmitter (FL version only)
9 Other

Note: All stock meters will include empty pipe detection electrode but it will not be functional unless the display option is also ordered.

11 DISPLAY OPTION

1 Blind
2 Display, with empty pipe detection
9 Other

12 POWER SUPPLY

1 85-260 VAC, 50/60 Hz
2 16-62 VDC
9 Other

13 SIGNAL OUTPUTS

B Pulse and current output with auxiliary input
C Pulse and current output with auxiliary input and automatic electrode cleaning.
9 Other

Ordering Information

Ordering Code: Promag 39A

1	2	3	4	5	6	7	8	9	10	11	12	13

1 LINER MATERIAL
T Teflon (PFA)

2 Size

	in.	mm.	Full Scale GPM min.	max.
02	1/12	2	0.015	0.49
04	5/32	4	0.06	1.99
08	5/16	8	0.24	7.96
15	1/2	15	0.85	28.0
25	1	25	2.40	77.8

3 PROCESS CONNECTION/GASKET MATERIAL

Connections which require an additional process connection mounting set (see p. 46)

A 1" threads/316LSS, Viton gasket
B 1" threads/316LSS, Kalrez gasket
C 1" threads/316LSS, Silicone gasket - 3A sanitary
D 1" threads/PVC, Viton gasket
E 1" threads/PVC, Kalrez gasket
1 1" threads/316LSS, Viton gasket - 3A Sanitary

Connections which DO NOT require an additional process connection mounting set

H ANSI 150-lb. flange/316LSS, Viton gasket
K ANSI 150-lb. flange/316LSS, Kalrez gasket
L ANSI 300-lb. flange/316LSS, Viton gasket
M ANSI 300-lb. flange/316LSS, Kalrez gasket
R ANSI 150-lb. flange/PVDF, Viton gasket
S ANSI 150-lb. flange/PVDF, Kalrez gasket
2 1" Tri-Clamp, 316LSS, Silicone gasket
3 1" Tri-Clamp, 316LSS, Viton gasket
4 1/2" Tri-Clamp, 316LSS, Silicone gasket, for 1/12" - 5/16" only
5 1/2" Tri-Clamp, 316LSS, Viton gasket, for 1/12" - 5/16" only
6 3/4" Tri-Clamp, 316LSS, Silicone gasket, for 1/2" only
7 3/4" Tri-Clamp, 316LSS, Viton gasket, for 1/2" only
9 Other

4 ELECTRODES/MATERIALS
D 316LSS measuring/grounding electrodes
F Hastelloy C-22 measuring/grounding electrodes
L Tantalum measuring/grounding electrodes
R Platinum/20% Rhodium measuring/grounding electrodes
9 Other

5 CERTIFICATES
1 Standard, without certificate
9 Other

6 PROTECTION TYPE/VERSION
H NEMA 4X sensor remote version, FL
9 Other

7 CABLE ENTRIES
A PG 11 sensor cable glands
9 Other

8 CABLE FOR REMOTE VERSION
1 No cable
B 33-ft coil/signal cable, FL
C Coil/signal cable, FL, specify length in feet (max 656 ft)
9 Other

9 CALIBRATION
1 3-point standard 0.5% calibration
2 5-point calibration 0.5% calibration
4 Bidirectional 3-point 0.5% calibration
9 Other

10 APPROVALS
A General Purpose
9 Other

11 DISPLAY OPTION
1 Digital display with menu controlled operation via keypad
9 Other

12 POWER SUPPLY
1 85-260 VAC, 50/60 Hz
2 16-62 VDC
9 Other

13 SIGNAL OUTPUTS
1 Frequency/current, auxiliary input, relay 1, relay 2, HART interface, Rackbus or Rackbus RS485 interface
9 Other

Wiring Connector Kits

w/flat pin terminals	#50048142
w/solder lug	#50048140

Note: A wiring connector kit is required for every Promag 39 transmitter, even when panel mount kit is not ordered.

Accessories:

Panel Mount accessory (requires one wiring connector kit)	#50075239
NEMA 4X wall enclosure	C/F

Ordering Information

Ordering Code: Promag 33D

1	2	3	4	5	6	7	8	9	10	11	12	13

1 LINER MATERIAL
- H Hard rubber
- W Soft rubber (EPDM)
- **T Teflon (PTFE)**

2 Size

	in.	mm	Full Scale GPM min.	max.
25	**1**	**25**	**2.4**	**77.8**
40	**1.5**	**40**	**6.0**	**199**
50	**2**	**50**	**9.4**	**311**
80	**3**	**80**	**24.0**	**796**
1H	**4**	**100**	**37.4**	**1,244**

3 SENSOR HOUSING MATERIAL
- **B Epoxy-coated carbon steel**
- D 316LSS (only available w/PTFE liner)
- 9 Other

4 ELECTRODES/MATERIALS
- D 316LSS measuring/grounding/empty pipe detection electrodes
- **H Hastelloy C-22 measuring/grounding/empty pipe detection electrodes**
- N Tantalum measuring/grounding/empty pipe detection electrodes
- R Platinum/20% Rhodium measuring/grounding electrodes
- T Platinum/20% Rhodium measuring/grounding/empty pipe detection electrodes
- 9 Other

5 CERTIFICATES
- **1 Standard, without certificate**
- 9 Other

6 PROTECTION TYPE/VERSION
- **E NEMA 4X compact version**
- **F NEMA 4X remote version**
- L NEMA 4X remote version, FL
- 9 Other

7 CABLE ENTRIES
- **D ½" NPT**
- 9 Other

8 CABLE FOR REMOTE VERSION
- **1 Separate/compact version without cable**
- **4 16.5-ft coil/signal cable with empty pipe detection, FS**
- **5 33-ft coil/signal cable with empty pipe detection, FS**
- **8 Coil/signal cable with empty pipe detection, FS, specify length in feet (max 656 ft (EPD max 33 ft))**
- B 33-ft coil/signal cable, FL (without empty pipe detection)
- C Coil/signal cable, FL (without empty pipe detection) specify length in feet (max 656 ft)
- 9 Other

9 CALIBRATION
- **1 3-point standard calibration**
- **2 5-point calibration**
- **3 0.5% calibration**
- **4 Bidirectional std. 3-point calibration**
- 9 Other

10 APPROVALS
- **D FM approved NI - Class I, Div. 2, Groups ABCD; DIP - Class II, Div. 1, Groups EFG**
- 9 Other

11 DISPLAY OPTION
- **1 Blind**
- **2 Display, with Touch Control**
- 9 Other

12 POWER SUPPLY
- **1 85-260 VAC, 50/60 Hz**
- **2 16-62 VDC**
- 9 Other

13 SIGNAL OUTPUTS
- **A Frequency & current/HART outputs**
- B Current output and Rackbus RS485
- C Frequency output and Rackbus RS485
- D Current output and auxiliary input (must order display option 2)
- E Frequency output and auxiliary input (must order display option 2)
- F Frequency & current/HART outputs with automatic electrode cleaning*
- G Current output & Rackbus RS485 with automatic electrode cleaning*
- H Frequency output & Rackbus RS485 with automatic electrode cleaning*
- K Current output and auxiliary input with automatic electrode cleaning* (must order display option)
- L Frequency output and auxiliary input with automatic electrode cleaning* (must order display option)
- 9 Other

Note: Promag 33D requires a process connection mounting set (see page 46).

Ordering Information

Ordering Code: Promag 33F

1	2	3	4	5	6	7	8	9	10	11	12	13

1 LINER MATERIAL

H	Hard rubber
T	Teflon (PTFE)
W	Soft rubber (EPDM)
U	Polyurethane *

2 SIZE

	in.	mm	Full Scale GPM min.	Full Scale GPM max.
15**	0.5	15	0.85	28
25**	1	25	2.4	77.8
40**	1.5	40	6	199
50**	2	50	9.4	311
80	3	80	24	796
1H	4	100	37.4	1,244
1F	6	150	84.1	2,801
2H	8	200	150	4,979
2F	10	250	234	7,780
3H	12	300	337	11,200
3F	14	350	458	15,250
4H	16	400	498	19,915
4F	18	450	757	25,205
5H	20	500	934	31,120
6H	24	600	1,345	44,815
7H	28	700	1,830	60,995
7F	30	750	2,101	70,025
8H	32	800	2,391	79,670
9H	36	900	3,026	100,830
T0	40	1000	3,735	124,485
V0	42	1050	4,118	137,250
T2	48	1200	5,378	179,260

Consult factory for 54" to 78" sizes

3 PROCESS CONNECTION / MATERIAL

M	150 lb. ANSI / A 105 steel (1/2" to 24" only)
N**	300 lb. ANSI / A 105 steel (1/2" to 6" only)
P	150 lb AWWA Class D / A 105 stee, 28" to 78"
R	150 lb. ANSI / 316LSS (1/2" to 24" only)
S**	300 lb ANSI / 316LSS (1/2" to 6" only)
9	Other

4 ELECTRODES / MATERIALS

D	316SS measuring / grounding / empty pipe detection electrodes
H	Hastelloy C-22 measuring / grounding / empty pipe detection electrodes
N	Tantalum measuring / grounding / empty pipe detection electrodes
R	Platinum / 20% Rhodium measuring / grounding electrodes
T	Platinum / 20% Rhodium measuring / grounding / empty pipe detection electordes
9	Otrher

5 CERTIFICATES

1	Standard, without certificate
9	Other

6 PROTECTION TYPE / VERSION

E	NEMA 4X / compact version
F	NEMA 4X / remote version FS
G	NEMA 6 submersible / remote version FS
L	NEMA 4X / remote, FL without empty pipe detection
M	NEMA 6 submersible / remote version, FL without empty pipe detection
9	Other

7 CABLE ENTRIES

D	1/2" NPT
9	Other

8 CABLE FOR REMOTE VERSION

1	Separate compact version without cable
4	16.5 ft. coil / signal cable with empty pipe detection, FS
5	33 ft. coil / signal cable with empty pipe detection, FS
8	Coil / signal cable with empty pipe detection, FS, specify lenght in feet (max. 656 ft.) Empty pipe detection, max. 33 feet
B	33 ft. coil / signal cable, FL (without empty pipe detection)
C	Coil / signal cable, FL (without empty pipe detection) specify length in feet, max. 656 ft.
9	Other

9 CALIBRATION

1	3-point standard calibration
2	5-point calibration
3	0.2% calibration
4	Bidirectional standard 3-point calibration
9	Other

10 APPROVALS

D	FM approved NI - Class 1, Div. 2, Groups ABCD; DIP - Class II, Div. 1, Groups EFG
E	FM approved Class I, II, & III, Div. 1, Groups A - G, compact version only
F	CSA Class I, Div. 2, Groups ABCD
G	CSA Class I, Div. 1, Groups ABCD, compact version only, up to 12"
O	FM approved Class I, II & III, Div. 1, Groups A - G sensor for use with Class I, Div. 2 transmitter, FL version only
9	Other

11 DISPLAY OPTION

1	Blind
2	Display with touch control
9	Other

12 POWER SUPPLY

1	85 to 260 VAC, 50/60 Hz
2	16 to 62 VDC
9	Other

13 SIGNAL OUTPUTS

A	Frequency and current / HART outputs
B	Current output and Rackbus RS 485
C	Frequency output and Rackbus RS 485
D	Current output and auxiliary input (must order display option 2)
E	Frequency output and axuiliary input (must order display option 2)
F	Frequency and current / HART outputs with automatic electrode cleaning **
G	Current output and Rackbus RS 485 with automatic electrode cleaning **
H	Frequency output and Rackbus RS 485 with automatic electrode cleaning **
K	Current output and auxiliary input with automatic electrode cleaning ** (must order display option 2)
L	Frequency output and auxiliary input with automatic electrode cleaning ** (must order display option 2)
9	Other

* Polyurethane liner option is only available in 1" to 12" sizes.

** Not available with hard rubber liner.

Ordering Information

Ordering Code: Promag 30H

1	2	3	4	5	6	7	8	9	10	11	12	13

1 LINER MATERIAL
- **P Teflon (PFA)**

2 Size

	in.	mm.	Full Scale GPM min.	max.
22	1	25	5	100
40	1.5	40	10	200
50	2	50	20	400
65	2.5	65	30	600
80	3	80	50	1,000
1H	4	100	75	1,500

3 PROCESS CONNECTIONS
- **A Weld connection for OD tubing**
- **F Tri-Clamp connection**
- 9 Other

4 ELECTRODES/MATERIALS
- **C 316LSS measuring/empty pipe detection electrodes***
- 9 Other

5 SEAL MATERIAL
- **A EPDM gaskets**
- **B Silicone (MVQ) gaskets**
- 9 Other

6 PROTECTION TYPE/VERSION
- **E NEMA 4X compact version**
- **F NEMA 4X remote version, FS**
- L NEMA 4X remote version, FL (empty pipe detection not possible)
- 9 Other

7 CABLE ENTRIES
- **C ½" NPT**
- 9 Other

8 CABLE FOR REMOTE VERSION
- **1 Separate/compact version without cable**
- **5 33-ft coil/signal cable with empty pipe detection, FS**
- **8 Coil/signal cable with empty pipe detection, FS, specify length in feet (max 656 ft (EPD max 33 ft))**
- B 33-ft coil/signal cable, FL (without empty pipe detection)
- C Coil/signal cable, FL (without empty pipe detection) specify length in feet (max 656 ft)
- 9 Other

9 CALIBRATION
- **1 3-point standard 0.5% calibration**
- **3 0.2% calibration (not for FL version)**
- **4 Bidirectional 3-point 0.5% calibration**
- 9 Other

10 APPROVALS
- **D FM approved NI - Class I, Div. 2, Groups ABCD; DIP - Class II, Div. 1, Groups EFG**
- F CSA Class I, Div. 2, Groups ABCD
- 9 Other

11 DISPLAY OPTION
- **1 Blind**
- **2 Display, with empty pipe detection**
- 9 Other

12 POWER SUPPLY
- **1 85-260 VAC, 50/60 Hz**
- **2 16-62 VDC**
- 9 Other

13 SIGNAL OUTPUTS
- **B Pulse and current output with auxiliary input**
- C Pulse and current output with auxiliary input and automatic electrode cleaning (cannot be ordered as FL remote version)
- 9 Other

Note: All stock meters will include empty pipe detection electrode but it will not be functional unless the display option is also ordered.

Ordering Information

Ordering Code: Promag 39H

1	2	3	4	5	6	7	8	9	10	11	12	13

1 LINER MATERIAL
- **P** Teflon (PFA)

2 Size

	in.	mm.	Full Scale GPM min.	max.
22	1	25	2.4	77
40	1.5	40	6	199
50	2	50	9.4	311
65	2.5	65	15.8	525
80	3	80	24	796
1H	4	100	37.4	1,244

3 PROCESS CONNECTIONS
- **A** Weld connection for OD tubing
- **F** Tri-Clamp connection
- 9 Other

4 ELECTRODES/MATERIALS
- **C** 316LSS measuring electrodes*
- 9 Other

5 SEAL MATERIAL
- **A** EPDM gaskets
- **B** Silicone (MVQ) gaskets
- 9 Other

6 PROTECTION TYPE/VERSION
- **H** NEMA 4X sensor remote version, FL
- 9 Other

7 SENSOR CABLE ENTRIES
- **A** PG13.5 cable gland
- 9 Other

8 CABLE FOR REMOTE VERSION
- **1** No cable
- **B** 33-ft coil/signal cable, FL (without empty pipe detection)
- **C** Coil/signal cable, FL (without empty pipe detection) specify length in feet (max 656 ft)
- 9 Other

9 CALIBRATION
- **1** 3-point standard 0.5% calibration
- **4** Bidirectional 3-point 0.5% calibration
- 9 Other

10 APPROVALS
- **A** General Purpose
- 9 Other

11 DISPLAY OPTION
- **1** Digital display with menu controlled operation via keypad
- 9 Other

12 POWER SUPPLY
- **1** 85-260 VAC, 50/60 Hz
- **2** 16-62 VDC
- 9 Other

13 SIGNAL OUTPUTS
- **1** Frequency/current output, auxiliary input, relay 1, relay 2, HART interface, Rackbus or Rackbus RS485 interface
- 9 Other

Wiring Connector Kits

w/flat pin terminals	#50048142
w/solder lug	#50048140

Note: A wiring connector kit is required for every Promag 39 transmitter, even when panel mount kit is not ordered.

Accessories:

Panel Mount accessory (requires one wiring connector kit)	#50075239
NEMA 4X wall enclosure	C/F

IFU 3036 Rotary Screen Installation, Operation and Maintenance Manual

IPEC

Manufactured by **IPEC Industries** for BCA Industrial Controls (1995) Limited

Serial Number 7721

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IFU Series Rotary Screen
Installation, Operation and Maintenance Manual

About this manual

Thank you for purchasing your IPEC IFU Series internally-fed rotary screen. Please read these instructions *before* you attempt to install and operate your screen. You can refer any questions to the **IPEC** Service Department.

This manual is divided into five sections:

Section 1	General Information
Section 2	Installation
Section 3	Operating Instructions
Section 4	Mechanical Maintenance
Section 5	Major Component

IFU Series Rotary Screen
Installation, Operation and Maintenance Manual

1.2.2 Screen Drum (Cont'd.)

The mesh lined IFU Rotary Screen has profile wire sections welded to flat bar structural members which forms the basic cylindrical cage. On the interior of the cage, woven mesh panels are fitted and supported by ribbed framing that bolts to the cage. The clamping of the mesh between the cage and the framing insures that the mesh maintains shape. The mesh is constructed of stainless steel or polyester.

The screen drum is fitted with a series of bars mounted on the screen surface in a fashion that directs solids axially during rotation.

1.2.3 Spray System

IFU Rotary Screens are equipped with an external spray bar for continual or intermittent cleaning of the screen slots using water or steam. The spray bar is mounted on the enclosure frame of the and contains fan shaped nozzles oriented to align directly with the screen slot. Nozzles are spaced 3 inches apart. The spray bar has NPT connections on either end for connection to supply.

1.2.4 Frame Enclosure

The headbox, screen drum, spray bars, and mechanical components mount separately in an enclosure fitted with structural support members. This enclosure frame has top and bottom members with the bottom part having legs and mounting plates. The upper enclosure is in sections that can be easily removed for access to the interior equipment.

1.2.5 Mechanical

The standard IFU Rotary Screen drive system consists of a fixed speed geardrive, drive sprocket, roller chain and large, driven sprocket which is mounted on the influent endplate of the screen drum. The drive is an helical worm gear box with integral motor. The drive sprocket is keyed and secured to the gearbox shaft with a set screw. The driven sprocket is bolted to the drum. The chain and sprocket are protected by a chain guard.

The wheels are constructed of solid, high density, polyurethane and fitted with precision ball bearings. They are secured to a stainless steel axle mounted in a support frame that is bolted to the enclosure frame.

2.1 Installation

2.1.1 Inspection

Before uncrating, examine packaging for any obvious damage. After uncrating, inspect for damage or unattached parts. Report any damage to your carrier and also notify IPEC INDUSTRIES.

Check all fasteners to ensure that they did not vibrate loose during shipment.

2.1.2 Moving Screen

The IFU Rotary Screen can be moved with forklift truck, with the forks placed under the base legs. If overhead lifting equipment is used, using shackles, attach cables to lifting lugs at the four corners of the base frame. It may be required to use spreader bars to ensure that no external forces are placed on the headbox, splash guards, mechanical equipment, or screen drum. Always transport the IFU unit in level position.

2.2 Site

2.2.1 Mounting

The IFU Rotary Screen is designed for mounting on a reasonably level concrete or steel structure. The unit must be fully supported under the four legs of the enclosure frame

2.2.2 Access

An area two feet wide along the side of the unit must be left clear to adequately service, clean and monitor operation.

To remove the drum, an area above the unit of at least drum size, must be left open.

2.2.3 Mounting

Level the unit at the assigned location. Place shims under the leg base. Bolt the unit to the floor at each base plate.

2.4 Electrical

Connect the drive motor to the proper power source, as listed on the motor name plate. Control wiring or controls are not supplied by IPEC INDUSTRIES.

Electrical connections must be in accordance to all national and local codes.

2.5 Mechanical

IFU units, for shipping, usually have some tie down strapping on free moving mechanical parts. Also, the screen drum is supported above the wheels on saddle shaped brackets. Remove all packaging and shipping supports, ensuring that the drum is lowered gently onto the wheels. See sections 3.1.1 and 3.1.2 regarding set up wheels and/or drive mechanics.

On gear box units required to be vented, remove packing plug and install supplied breather plug.

3.2 Extended Shut-down

If the IFU Rotary Screen is to be shut down for a long period of time, the unit should be drained and cleaned so that solids do not dry up on the surfaces and in the screen openings. The following steps will prevent problems.

3.2.1 Shut off influent to the headbox and the drive motor.

3.2.2 Open the drain on the headbox to allow water to discharge.

3.2.3 Start up the drive and turn on the spray system. Hose down the inside of the headbox and all parts of the screen drum, splash guards and headbox that are accessible from outside the unit. Do not stick hose nozzles or other cleaning equipment into the interior of the screen drum under rotation, or allow them to come in contact with any moving part of the unit.

3.2.4 Stop the spray system and the drive unit. Reinstall the drain cover on the headbox.

4.1 Mechanical Maintenance

4.1.1 To ensure adequate cooling of the drive motor, remove build-up of dust, dirt or sludge material from depositing on the cooling fins of the motor casing or in and around the motor fan.

4.1.2 On gear box units equipped with ventilation ports, ensure that build-ups do not plug the opening **monthly**.

4.1.3 Gear box lubricating oil level should be checked every **3 months**. An oil change should be carried out after the initial 3 months of operation, thereafter, about once per year. However, under severe environments or operating conditions, oil should be changed more frequently.

It is recommended the lubricating oil listed in the gear drive manual be used. Other oils with comparable specifications can be used, but it is generally not permissible to mix oils from different manufacturers.

4.1.4 The drive chain should be oiled once per week for continuously operating units. A lightweight, non-detergent oil is standard. Drive chain tension and sprocket alignment should be checked **monthly**.

4.1.5 Wheels and bearings should be greased **monthly**. A standard petroleum based bearing grease is normally used. Where unit has been installed in high humidity environments or where frequent high volume water washdowns occur in and around the unit, then a silicone based grease is recommended **weekly**.

4.2 Wheel Removal

The screen drum is held in place by the four wheels. It is important that, whenever maintenance is performed on the wheels, the screen drum is secured. Remove a wheel from the IFU unit as follows:

4.2.1 Stop the influent. Allow the IFU drive unit and spray system to operate several minutes to remove the residual solids.

4.4.3 Disconnect the spray collection trough and remove the distribution weirs.

4.4.4 On IFU units with the headbox supported on the solid discharge end, unbolt the tank support arms at both ends and remove.

4.4.5 Unbolt influent piping and remove piping for headbox clearance. Unbolt headbox flange fasteners, then slide headbox from interior of drum.

4.4.6 The drum should be lifted by placing a sling around each roll ring, fastening the sling to overhead lifting device, and applying necessary force to elevate the drum about 2 inches above the wheels. Position drum so that drum ends clear all support structure. Once clear, the drum can be lifted vertically. It is now completely free of the frame. When depositing the drum outside the frame, ensure that it is supported by the roll ring section. Do not allow any localized force to bear on the screen section of the drum.

4.5 Screen Panel Changeout – (for mesh-lined drums only)

Mesh panels can be cut from commercially available, standard stock. Panels can be cut to the same size as the mesh framer, or oversized and trimmed after installation.

4.5.1 Remove drum according to Section 4.4.

4.5.2 Using a slot screwdriver, pry the framer away from the screen structural bars. Slide the mesh from under the framer, ensuring that the backing mesh stays in place.

4.5.3 Install the replacement panel. Ensure that one side edge extends under the center strut at least 0.25 inch. Smooth mesh against the backing mesh. Press the framer down on the mesh panels.

4.5.4 Starting from the center of the framer, and using a scriber or sharp center punch, poke holes in the mesh at the first bolt hole on the frame end. Align framer hole with matching hole on cage and fasten nut and bolt. Proceed in succession along the end edge, then likewise along the side of framer.

4.6 Mechanical Maintenance Schedule Sheet

This schedule is intended for use in a preventive maintenance program. Service frequencies are estimates for typical environments. These frequencies should be

5.0 Major Components

	Components	Description	Part No.	Spare
5.1	Enclosure	Enclosure Base	13301	
		Enclosure Top	13302	
		Enclosure Cover	13305	
		End Guard	10315	
5.2	Screen Assembly	Screen Drum	2303.100	
		Influent Drum Head	23071	
		Discharge Drum Head	23073	
5.3	Mechanical Components **Drive *SEW Eurodrive* Model: SA57DT71D4 Ratio: 54.59:1 Motor: Integral ½ hp TEFC 1750 rpm 330/575 volt	Drive	**	
		Small Sprocket	60142	
		Large Sprocket	61210	
		Chain	660	
		Chain Guard	62910	
		Drum Wheel	81210	
		Axle	6211	
		Wheel Frame	63001	
		Wheel Bearing	6116	
		Front Wheel Cover	81201	
		Back Wheel Cover	81202	
5.4	Headbox Assembly	Headbox	43300	
		Weir	43320	
		Spray Collection	43330	
		Headbox Support Arm	43371	
5.5	Spray System	External Spray Bar	5105830S	
		Nozzle	5712	

Serial Number: 7721

Date of Manufacture: 02/02

4.6 Installation of torque arms for shaft-mounted gear units

Do not strain torque arms during installation!

Parallel shaft helical gear units

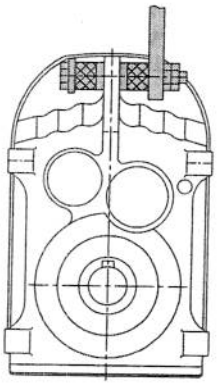

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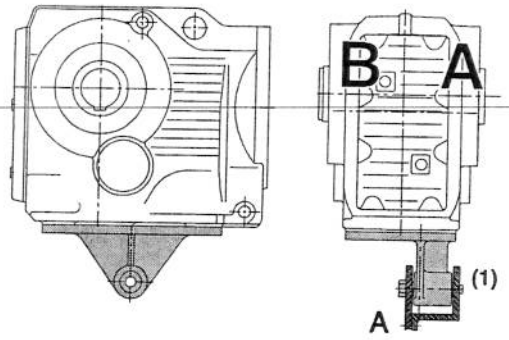
Fig. 7: Torque arm for parallel shaft gear units

Helical-bevel gear units

- Bushing with bearings on both ends → (1)
- Install connection end B as a mirror image of A



01030CXX

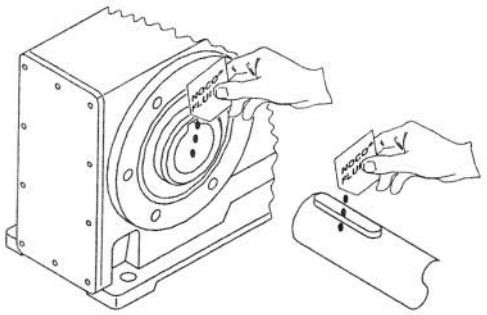
Fig. 8: Torque arm for helical-bevel gear units

4.7 Installation/removal of shaft-mounted gear units with key or splines

Note the construction notes in the Geared Motors catalog when designing the customer shaft!

Installation notes

1. Apply NOCO® fluid



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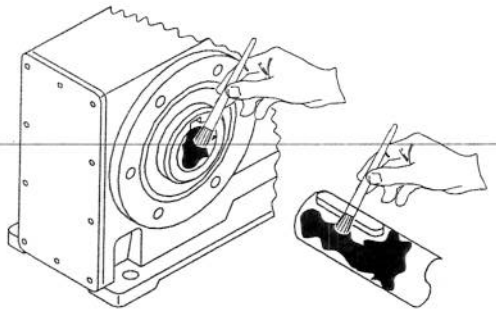
2. Distribute NOCO® fluid evenly



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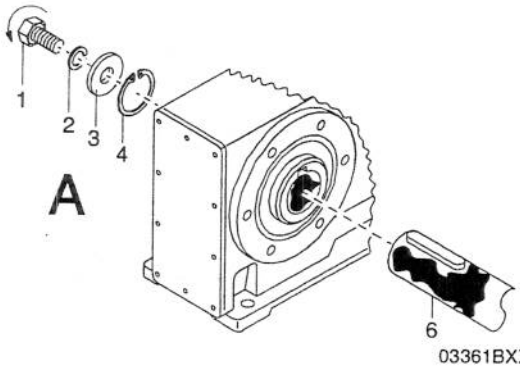
3. Install shaft and secure axially
   (installation will be made easier by using a mounting device)

   3A: Installation with standard components



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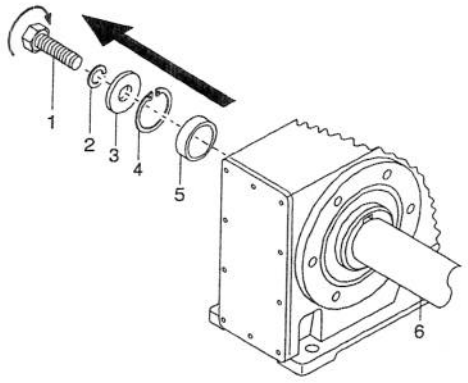
1 short retaining screw (standard components)
2 lock washer
3 washer
4 circlip
6 customer shaft

Removal notes

The description applies only to gear units that were installed with the SWE mounting/ removal kit (→ page 22) (see previous description, points 3B or 3C)

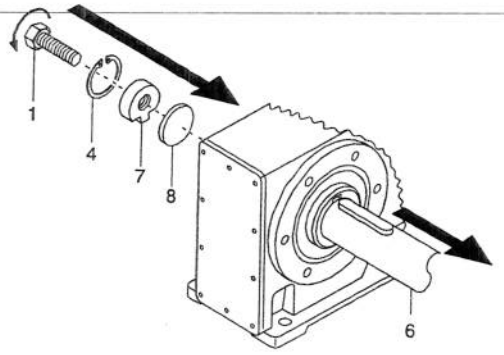
1. Loosen the retaining screw 1.
2. Remove parts 2 to 4 and the spacer tube 5, if installed.



1 retaining screw
2 lock washer
3 washer
4 circlip
5 spacer tube
6 customer shaft

03366AXX

3. Install the removal washer 8 and the locknut 7 from the SEW installation/removal kit between customer shaft 6 and circlip 4.
4. Reinstall the circlip 4.
5. Reinstall the retaining screw 1. You can now remove the gear unit from the shaft by tightening the screw.



1 retaining screw
4 circlip
6 customer shaft
7 locknut
8 removal washer

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