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PROGRAM GUIDANCE FOR FLOW METER AND DIGITAL DISPLAY INSTRUMENTS ON THE PUMPING INSTRUMENTATION AND CONTROL SKIDS

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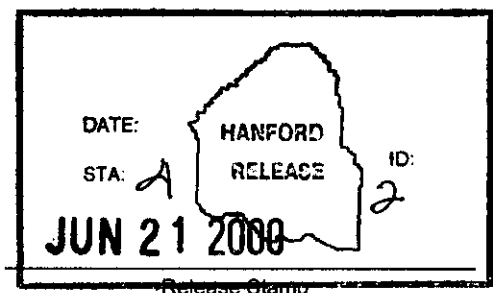
Abstract:

This guidance is for the programming of the Yokogawa flow meter and
Yokogawa digital displays on the PIC skids.

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PROGRAM GUIDANCE FOR FLOW METER AND DIGITAL DISPLAYS ON PUMPING INSTRUMENTATION AND CONTROL SKIDS

INTRODUCTION

The Pumping Instrumentation and Control Skids (PICS) contain a flow meter to display the flow in the discharge line and two digital displays to show the pressure in the suction and discharge lines of the jet pump. These three instruments require programming during initial setup. Programming consists of inputting parameters to fit the field application of the instruments.

SCOPE

This guidance document provides the initial programming parameters for the Yokogawa AE14 flow meter and the Yokogawa UM330 digital display units. The guidance applies only to initial programming and may be changed in the field during setup of the PICS at specific tanks.

FLOW METER PROGRAM

The Yokogawa flow meter is located in the Instrument Enclosure on the PIC skid. Appendix A provides a list of the programming parameters for the flow meter. Programming of the flow meter can be performed using a "Brain terminal" or by using the three white buttons on the front of the unit. The top portion of the chart in Appendix A identifies the parameters that must be entered to setup the flow meter for calibration and field use. The bottom portion of the chart contain parameters that normally remain at factory settings.

The shaded portion of the program chart contains the displays and settings when using the three white buttons on the face of the flow meter. Note there are some settings that are not available when using the white buttons, but are available when using the brain terminal. Engineering will provide the high and low meter factors. Reference the vendor's manual for AE14 Flow meters for instructions as to the operation of the white buttons or the brain terminal.

Appendix A contains a sample printout of the flow meter parameters. This printout is only available when using the brain terminal. The "L01" parameter allows the programmer to "disable" the parameters from being changed once setup.

DIGITAL DISPLAY PROGRAMMING

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Appendix B contains the programming chart for the digital displays that monitor the suction and discharge pressure. These two displays require programming prior to calibration. The chart in Appendix B lists the parameters and values to be entered. The parameters on the bottom portion of the chart should not require changing and should be left with the factory settings. Reference the vendor's manual for the UM330 for details as how to enter the program parameter settings.

APPENDIX A: YOKOGAWA FLOW METER PROGRAM

YOKOGAWA FLOW METER PROGRAM VALUES TO BE SET				
LCD DISPLAY	SETTINGS	BRAIN TERMINAL	SETTINGS	DESCRIPTION
		B01	6001@	Tag no. (@= skid letter)
02	1.0	B02	1.0	Time constant, 1 sec.
03	14.000#	B03	14.000#	Span
04	06	B04	GAL	Gallons
05	02	B05	/M	Minutes
06	01	B06	INCH	Inches
07	0.5	B07	0.5	Flow tube nominal size
08	*	B08	*	Low meter factor
09	*	B09	*	High meter factor
10	1	B10	ALARM OUT	Output function
12	60.0	B12	60.0	Power frequency
d1	06	D01	RATE/FOR TTL	Display select
E1	03	E01	UNIT/P	Totalizer units
E2	1	E02	1	Multiplier of E2(1gpm)
E3	1	E03	1	Minimum per cent reading

Engineering to provide actual span value, normally 8 or 14gpm.

* Values taken from flow head to be used with flow meter.

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YOKOGAWA FLOW METER PROGRAM FACTORY SETTINGS				
LCD DISPLAY	SETTINGS	BRAIN TERMINAL	SETTINGS	DESCRIPTION
I1	00	B11	2.4mA or LESS	4-20 ALM OUT
I3	(computer generated)	B13	(computer generated)	(NOT USED WHEN B06 SET TO INCHES)
I4	00	B14	FORWARD	FLOW DIRECTION
30	10.000	B30	10.000GAL/M	REV. SPAN
31	2	B31	2	DIREC HYS %
33	10.000	B33	10.000GAL/M	FOR. SPAN2
34	10	B34	10	HYS
36	-10	B36	-10	LOW ALARM %
37	5	B37	5	L. ALARM HYS %
C1	01	C01	ENABLE	ZERO TUNING
C2	0.02	C02	0.02	MAGFLOW ZERO
d2	00	D02	NOT PROVIDED	DISPLAY PANEL SELECTION
d3	100	D03	100	USER SPAN
		D10	(SPACE)	USER UNIT
E4	01	E04	ENABLE	TOTAL SET
E5	0	E05	0	TL SET VALUE
E6	0	E06	0	TOTAL SWITCH
		E10	(SPACE)	TL USER UNIT
		E11	0	REV. TOTAL
		E12	-1	DIF. TOTAL
G1	0	G01	0	4-20 LOW CUT
G2	-20	G02	-20	4-20 LOW LMT
G3	120	G03	120	4-20 H LMT
H1	00**	H01	NORMAL**	TEST MODE
H2	**	H02	**	OUTPUT VALUE
H3	00	H03	NORMAL	STATUS OUT
L1	01***	L01	ENABLE***	TUNING
L2	55	L02	55	KEY
n1	01	N01	DAMP	TOTAL/PAUSE
n2	00	N02	ON	OUTPUT MODE
n3	5	N03	5	RATE LIMIT
n4	0	N04	0	DEAD TIME
n5	00	N05	YES	POWER SYNCH
n6	01	N06	NO	PULSING FLOW
n7	00	N07	ALARM	EMPTY PIPE

** For test mode, H1 is changed to "TEST" (00) and H2 is set to percent of output desired.

*** Change to "DISABLE" (00) to prevent unauthorized data changes.

EXAMPLE
YOKOGAWA FLOW METER PROGRAM PRINTOUT

TITLE: 6001P
DATE 06-08-00 TIME 08:00
A10: FLOW RATE (%)
 -10.0 %
A20: FLOW RATE
 -0.800 gal/m
A30: TOTAL
 0.
A60: SELF CHECK
 ERROR

B01: TAG NO

 6001P
B02: DAMPING
 1.0 Sec
B03: FLOW SPAN
 14.000 gal/m
B04: FLOW UNIT

 Gal
B05: TIME UNIT
 /m
B06: SIZE UNIT
 inch
B07: NOMINAL SIZE
 0.50 inch
B08: LOW MF
 1.3052
B09: HIGH MF
 1.2140
B10: OUTPUT FUNC
 ALARM OUT
B11: 4-20 ALM OUT
 2.4mA OR LESS
B12: POWER FREQ
 60.01 Hz
B13: VELOCITY CHK
 3.984 m/s
B14: FLOW DIR
 FORWARD
B30: REV. SPAN
 10.0000 gal/m
B31: BI DIREC HYS
 2. %
B33: FOR. SPAN2
 10.000 gal/m

B34: AUTO RNG HYS
 10. %
B36: LOW ALARM
 - 10. %
B37: L. ALARM HYS
 5. %

B60: SELF CHECK
 ERROR

C01: ZERO TUNING
 ENABLE
C02: MAGFLOW ZERO
 0.02
C60: SELF CHECK
 ERROR

D01: DISP SELECT

 RATE/FOR. TTL
D02: FL USER SEL
 NOT PROVIDED
D03: FL USER SPAN
 100.0
D10: FL USER UNIT

D60: SELF CHECK
 ERROR

E01: TOTAL UNIT
 UNIT/P
E02: TOTAL SCALE
 1.0 UNIT/P
E03: TOTAL LOWCUT
 1. %
E04: TOTAL SET
 ENABLE
E05: TL SET VALUE
 0.
E06: TOTAL SWITCH
 0.
E10: TL USER UNIT

E11: REV. TOTAL
 0.
E12: DIF. TOTAL
 -1.

E60: SELF CHECK
 ERROR

G01: 4-20 LOW CUT
 0. %
G02: 4-20 LOW LMT
 - 20%
G03: 4-20 H LMT
 120. %

G60: SELF CHECK
 ERROR

H01: TEST MODE
 NORMAL
H02: OUTPUT VALUE
 0. %
H03: STATUS OUT
 NORMAL
H60: SELF CHECK
 ERROR

L01: TUNING
 ENABLE
L02: KEY
 55.
L60: SELF CHECK
 ERROR

N01: TOTAL/PULSE
 DAMP
N02: OUTPUT MODE
 ON
N03: RATE LIMIT
 5. %
N04: DEAD TIME
 0. sec
N05: POWER SYNCH
 YES
N06: PULSING FLOW

 NO
N07: EMPTY PIPE
 ALARM
N60: SELF CHECK
 ERROR

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APPENDIX B: DIGITAL DISPLAY PROGRAM

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YOKOGAWA DIGITAL DISPLAY PROGRAM SETTINGS		
SYMBOL	DESCRIPTION	PROGRAM ENTRY
Set the following parameters first.		
IN	Input type	41
UNIT	Input unit	N/A
RH	Maximum measured range input	5
RL	Minimum measured range input	1
SDP	Decimal point position	1
SH	Input scale upper limit	300 (discharge); 100 (suction)
SL	Input scale lower limit	0
RJC	Input RJC	ON
BSL	Input burnout operation selection	1
RET	Retransmission output	1
RTH	Maximum retransmission	N/A
RTL	Minimum retransmission	N/A
DIS	DI function selection	1
C.S1	Display 1	OFF
C.S2	Display 2	OFF
C.S3	Display 3	OFF
C.S4	Display 4	OFF
LOCK	Keylock	OFF
PWD	Password	1
The parameters below remain with factory default settings.		
A1	Alarm 1	1
A2	Alarm 2	2
A3	Alarm 3	1
A4	Alarm 4	2
PEAK	Maximum value of PV	N/A
BOTM	Minimum value of PV	N/A
FL	Input filter	Off
BS	Input bias	0
HY1	Alarm 1 hysteresis	0.5
HY2	Alarm 2 hysteresis	0.5
HY3	Alarm 3 hysteresis	0.5
HY4	Alarm 4 hysteresis	0.5
P.SL	Protocol selection	0
BPS	Comm. Speed	4
STP	Stop bit	1
DLN	Data length	8
ADR	Address	1
RP.T	Minimum response time	0