

JEA Water & Wastewater Standards

Piping and Instrumentation Diagram
Specifications

2024 – Edition

“Foundation for the Future - Water & Wastewater Standards”

P&ID Standard – Revision 2

The following guidelines are supplied to the consultant to ensure a well thought out design which provides a process by which both engineers and JEA Staff may be able to quickly evaluate the design process and provide comments to the engineer. These comments should create points of discussion to better refine the design in order to provide a complete document which both meets the needs and desires of JEA and provides a proper working set of plans. This Standard will ensure the design documents have clear instructions to the contractor to be able to accurately price the project, build the project correctly to obtain the initial desires of JEA and provide documentation which will allow JEA personnel to properly maintain the process to the designed standards.

The design may start with a Process Flow Diagram (PFD) as indicated by the ISA Standard (ISA: International Society of Automation). A Process Flow Diagram defines a process schematically. PFDs are most valuable for continuous process chemical plants. The PFD shows what and how much of each product a plant might make; descriptions and quantities of the raw materials necessary; by-products produced; critical process conditions — pressures, temperatures, and flows; necessary equipment; and major process piping. This diagram, if used would be the basis for the P&ID, however, the engineer may proceed directly to the P&ID.

The acronym P&ID is widely understood within the process industries to mean the principal document used to define the process—the equipment, piping, and all I&C components. ISA’s Automation, Systems, and Instrumentation Dictionary definition for P&ID tells us what they do. P&IDs “show the interconnection of process equipment and instrumentation used to control the process.” All P&IDs shall be 100% complete by the first submittal with the exception of any future changes.

P&IDs are developed in steps by members of the various design disciplines as a project proceeds. Information placed on a P&ID by one discipline is used by other disciplines as the basis for their design.

The P&ID should include the following:

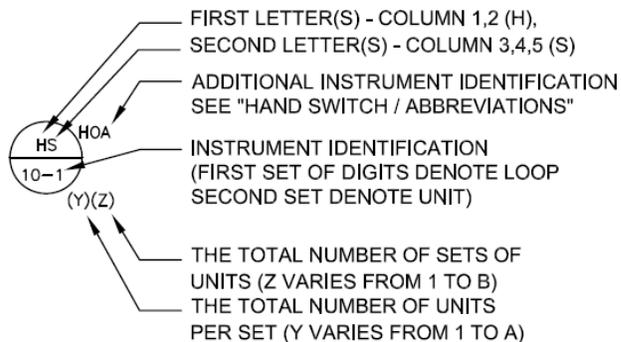
- Complete interconnection of process equipment, automation and instrumentation used to control, measure, protect, view, and document the process.
- Use symbols based on ISA-5.1-2009 and ISA-5.3-1983
- Follow JEA Standardized Symbols as documented in this specification.
- Document all process piping with area, sizes and loop identification as documented in this specification.
- Indicate all mechanical equipment, including all mechanical and electrical/control connections as well as identification labels.
- Document all valves including all electrical/control connections as may be required as well as identification labels.
- Flow direction.
- Include all Automation, Instrumentation, and Control Panels as well as the type of connections, locations and identification as documented in this specification. All Automation, Instrumentation and Control Panels shall have letter designations and tag numbers identifying those components (Loop Number). All devices in a loop have the same area number, but different letter designations, i.e. 41-LT-100, 41-LIC-100, 41-PIT-100. Loop Numbering shall correspond with the area number in the LINE/PIPE DESIGNATION, see below.
- Identification of equipment by others
- Miscellaneous – vents, drains, special fittings

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- Reference to specifications: This shall be located at all control panels (both third party and system integrator), MCC, Switchgear and all mechanical equipment which are being controlled. JEA has developed an "INSTRUMENTATION AND CONTROL LEGEND" standard as described in this document. The Engineer is expected to incorporate this sheet into the Drawing Set which will be provided to JEA. This is expected to be accomplished by the 30 Percent Drawing Set or the first submitted Drawing Set. The P&ID is expected to be 100 percent complete when the first submittal is submitted.

INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS



HAND SWITCH / ABBREVIATIONS

AO = AUTO/OFF	LOS = LOCKOUT/STOP
AM = AUTO/MANUAL	LA = LOCAL/AUTO
CAM = COMPUTER/AUTO/MANUAL	LR = LOCAL/REMOTE
CM = COMPUTER/MANUAL	OC = OPEN/CLOSED
CL = COMPUTER/LOCAL	OCA = OPEN/CLOSED/AUTO
E-STOP = EMERGENCY STOP	OO = ON/OFF
ED = ENABLE/DISABLE	OOA = ON/OFF/AUTO
FR = FORWARD/REVERSE	OOR = ON/OFF/REMOTE
FOR = FORWARD/OFF/REVERSE	OSC = OPEN/STOP/CLOSED
FS = FAST/SLOW	RSL = RAISE/STOP/LOWER
FOS = FAST/OFF/SLOW	SS = START/STOP
HOA = HAND/OFF/AUTO	SSR = SUPERVISORY SET-POINT (BY COMPUTER), AUTO/MANUAL CONTROL STATION
LLS = LEAD/LAG/STANDBY	SOR = START/OFF/RESET
LOC = LOCAL/OFF/COMPUTER	
LOR = LOCAL/OFF/REMOTE	

An example INSTRUMENT IDENTIFICATION has been provided with a set of abbreviations such as a HOA. These abbreviations are not intended to be exhaustive but are simply made to provide the form and fit for instrument symbols. It is requested that engineers provide combinations which they typically use and JEA will make every attempt to include these abbreviations into the standard. However, it is possible to have multiple requests for a single combination of letters and in this case JEA will utilize the most common combination used in JEA's normal day to day usage.

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ANSI/ISA-5.1-2009

Table 4.1 — Identification letters

	First letters		Succeeding letters		
	Column 1	Column 2	Column 3	Column 4	Column 5
	Measured/Initiating Variable	Variable Modifier (10)	Readout/Passive Function	Output/Active Function	Function Modifier
A	Analysis		Alarm		
B	Burner, Combustion		User's Choice	User's Choice	User's Choice
C	User's Choice			Control	Close
D	User's Choice	Difference, Differential			Deviation
E	Voltage		Sensor, Primary Element		
F	Flow, Flow Rate	Ratio			
G	User's Choice		Glass, Gauge, Viewing Device		
H	Hand				High
I	Current		Indicate		
J	Power		Scan		
K	Time, Schedule	Time Rate of Change		Control Station	
L	Level		Light		Low
M	User's Choice				Middle, Intermediate
N	User's Choice		User's Choice	User's Choice	User's Choice
O	User's Choice		Orifice, Restriction		Open
P	Pressure		Point (Test Connection)		
Q	Quantity	Integrate, Totalize	Integrate, Totalize		
R	Radiation		Record		Run
S	Speed, Frequency	Safety		Switch	Stop
T	Temperature			Transmit	
U	Multivariable		Multifunction	Multifunction	
V	Vibration, Mechanical Analysis			Valve, Damper, Louver	
W	Weight, Force		Well, Probe		
X	Unclassified	X-axis	Accessory Devices, Unclassified	Unclassified	Unclassified
Y	Event, State, Presence	Y-axis		Auxiliary Devices	
Z	Position, Dimension	Z-axis, Safety Instrumented System		Driver, Actuator, Unclassified final control element	

The table above, Table 4.1 – Identification letters from ANSI/ISA-5.1-2009 is made available to describe the letters located in the top half of the INSTRUMENT IDENTIFICATION circle illustrated on Page 2. In the example on Page 2, HS is used. IF one were to follow the left column above (Table 4.1 – Identification letters), down to the “H” and then across to the next column, the label reads “HAND”. Then follow the left column above, down to the “S” and then across to column 4, the label reads “Switch”. This is the symbol for a HAND SWITCH. This symbol is modified by the letters on the upper right, outside of the INSTRUMENT IDENTIFICATION circle and indicated as “HOA”. The abbreviation

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“HOA” may be understood by looking at the HAND SWITCH/ABBREVIATIONS list located directly under the INSTRUMENT IDENTIFICATION EXAMPLE SYMBOLS. In this example (HOA = HAND/OFF/AUTO), it is identified as a three-position switch with the first position being the HAND position, the second position being the OFF position, and the third or last position being the AUTO position. Additional abbreviations are indicated, and the meaning would be analogous to the above.

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

1		PILOT LIGHT ON FIELD MOUNTED INSTRUMENT			
2		PILOT LIGHT ON INSTRUMENT OR DEVICE LOCATED IN OR ON FRONT OF CENTRAL OR MAIN PANEL/CONSOLE. OPERATOR ACCESSIBLE		VISIBLE ON VIDEO DISPLAY LOCATED ON FRONT OF CENTRAL OR MAIN PANEL/CONSOLE (SCADA). OPERATOR ACCESSIBLE	7
3		PILOT LIGHT ON INSTRUMENT OR DEVICE LOCATED IN OR ON FRONT OF MCC OR REMOTE PANEL/CONSOLE. OPERATOR ACCESSIBLE		VISIBLE ON VIDEO DISPLAY LOCATED ON FRONT OF MCC. OPERATOR ACCESSIBLE	8
4		FIELD MOUNTED INSTRUMENT		FIELDBUS IMPLEMENTED FUNCTION LOCATED ON FIELD DEVICE. PB = PROFIBUS, PN = PROFINET, EN = ETHERNET, MB = MODBUS, MAY OR MAY NOT BE OPERATOR ACCESSIBLE	9
5		INSTRUMENT OR DEVICE LOCATED IN OR ON FRONT OF CENTRAL OR MAIN PANEL/CONSOLE. OPERATOR ACCESSIBLE		PLC IMPLEMENTED FUNCTION	10
6		INSTRUMENT OR DEVICE LOCATED IN OR ON FRONT OF MCC OR REMOTE PANEL/CONSOLE. OPERATOR ACCESSIBLE		FIELDBUS IMPLEMENTED FUNCTION LOCATED ON MCC. PB = PROFIBUS, PN = PROFINET, EN = ETHERNET, MB = MODBUS, MAY OR MAY NOT OPERATOR ACCESSIBLE	11

The GENERAL INSTRUMENT OR FUNCTION SYMBOLS chart is provided as guide to indicate and locate instruments in the drawing set.

1. In the GENERAL INSTRUMENT OR FUNCTION SYMBOLS chart, the first symbol located in the top left (1) is a Pilot Light. An example of this might be located near a tank in the field to indicate it is being overfilled. Pilot Light might also be located at a Disconnect Switch to indicate the device is closed and the equipment is running.
2. The next symbol (2) is a Pilot Light which might be located on a main control panel, HVAC control panel, etc.
3. The third symbol on the left (3) is a Pilot Light located on an MCC or Switchgear, etc. An example of this might be a Pilot Light for ON and another for OFF.
4. The fourth symbol on the left (4) is a field mounted instrument. An example of this could be a Motorized Control Valve.
5. The fifth symbol on the left (5) is an instrument mounted on or in a control panel. An example of this could be a panel meter mounted on a control panel.
6. The sixth symbol on the left (6) is an instrument or device located on or in an MCC/Switchgear, etc. An example of this could be a motor starter on an MCC, etc.

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7. The first symbol on the right (7) is for video display on either a main panel HMI or computer SCADA screen.
8. The second symbol on the right (8) is for an HMI or SCADA screen which is located on an MCC or Switchgear.
9. The third symbol on the right (9) is for a field bus device located in the field. The letters located on the right lower side will define the type of field bus used. In this example, the field bus used is labeled PN which is an abbreviation for PROFINET. Additional symbols are given in the description to the right. These descriptions include PB = PROFIBUS, EN = ETHERNET, MB = MODBUS. An example of this might be a Motor Control Actuator, being controlled by PROFINET. Both, the FIELD MOUNTED INSTRUMENT symbol (4. above) and this symbol would be located at the device location.
10. The fourth symbol on the right (10) is for a PLC communicating on field bus located in a control panel. In this example, the field bus used is labeled PN which is an abbreviation for PROFINET. Additional symbols are given in the description to the right. These descriptions include PB = PROFIBUS, EN = ETHERNET, MB = MODBUS. An example of this might be a PLC located in a panel in the electrical room, communicating to other devices over PROFINET. The PLC maybe represented by Box labeled as the PLC and the Name of the PLC with this symbol located at the device location.
11. The fifth symbol on the right (11) is for a field bus device located in or on an MCC or Switchgear. In this example, the field bus used is labeled PN which is an abbreviation for PROFINET. Additional symbols are given in the description to the right. These descriptions include PB = PROFIBUS, EN = ETHERNET, MB = MODBUS. An example of this might be a VFD located in a MCC in the electrical room, communicating to other devices (PLC) over PROFINET. The VFD maybe represented by Box labeled as the VFD and the Name of the VFD with this symbol located at the device location.

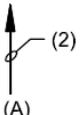
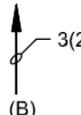
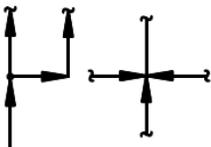
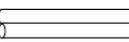
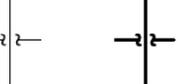
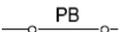
TRANSDUCERS

A ANALOG	I CURRENT
D DIGITAL	P PNEUMATIC
E VOLTAGE	PF PULSE FREQUENCY
F FREQUENCY	PD PULSE DURATION
H HYDRAULIC	R RESISTANCE

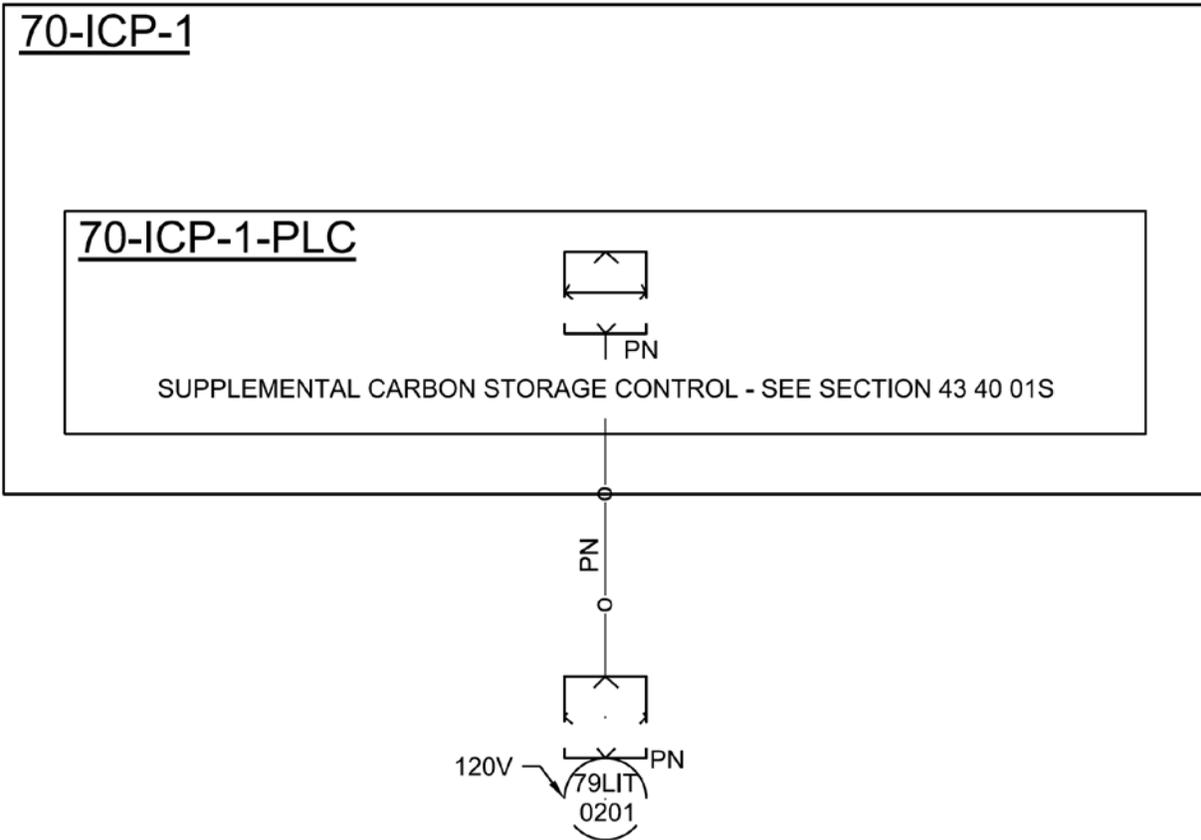
EXAMPLE:

I/P
——— CURRENT TO PNEUMATIC
TRANSUCER (BACK OF
PANEL, IN A FLOW LOOP)

LINE LEGEND

	PROCESS (CLOSED CONDUIT, DASHED LINE INDICATES ALTERNATE FLOW STREAM)	PARALLELING LINES		
	PROCESS (EXISTING)		(A) TOTAL OF 2 SIGNALS	(B) 3 TYPICAL SETS OF 2 SIGNALS EACH. TOTAL OF 6 SIGNALS.
	PROCESS (OPEN CHANNEL)	CONNECTING LINES		
	DOUBLE WALL CONTAINMENT	NON-CONNECTING LINES		
	ANALOG SIGNAL (4 TO 20 mA dc, ETC.)		DISCRETE INPUT	
	DISCRETE SIGNAL (ON/OFF, ETC.)		ANALOG INPUT (X=TC - THERMOCOUPLE INPUT, RTD - RTD INPUT)	
	PNEUMATIC SIGNAL			
	CAPILLARY TUBE			
	DATA LINK			
	PROFINET DATA LINK			
	PROFIBUS DATA LINK			
	SERIAL SIGNAL			
	FIBER OPTIC			
	PROFINET ON FIBER OPTIC			
	PROFIBUS ON FIBER OPTIC			
	PACKAGE SYSTEM EQUIPMENT			
	EQUIPMENT/PROCESS BOUNDARY			
	BUILDING OR FACILITY BOUNDARY			
	HEAT TRACED			

The above LINE LEGEND appears to be self-explanatory. However, the PROFINET and PROFIBUS DATA LINK are to be used for copper cable connections. Additional abbreviations such as EN = ETHERNET, MB = MODBUS may also be used. The PROFINET and PROFIBUS DATA ON FIBER OPTIC are to be used for fiber connections. Additional abbreviations such as EN = ETHERNET, MB = MODBUS may also be used.



The above example is offered to illustrate the information covered so far. Starting from the bottom and working up:

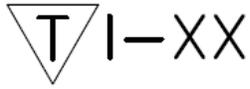
1. Using the GENERAL INSTRUMENTS OR FUNCTION SYMBOLS chart, this is a field mounted instrument. Then using the INSTRUMENT IDENTIFICATION LETTERS TABLE with the letters LIT, L=LEVEL; I=INDICATE; and T=TRANSDUCER, hence the “79LIT0201” designation.
2. The instrument 79LIT0201 is powered by 120V.
3. This transducer is communicating over PROFINET via a PROFINET cable to a PLC. This can be found by utilizing the GENERAL INSTRUMENTS OR FUNCTION SYMBOLS chart. The PLC (70-ICP-1-PLC) is in a Control Panel (70-ICP-1) and has a communication module which communicates over PROFINET.
4. Additionally, as shown in this example, the control panel functional (sequence of operations) and panel specifications are located in specifications section titled SUPPLEMENTAL CARBON STORAGE CONTROL – SEE SECTION 43 40 01S.
5. The PLC is also shown located inside the control panel.

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TABLES:

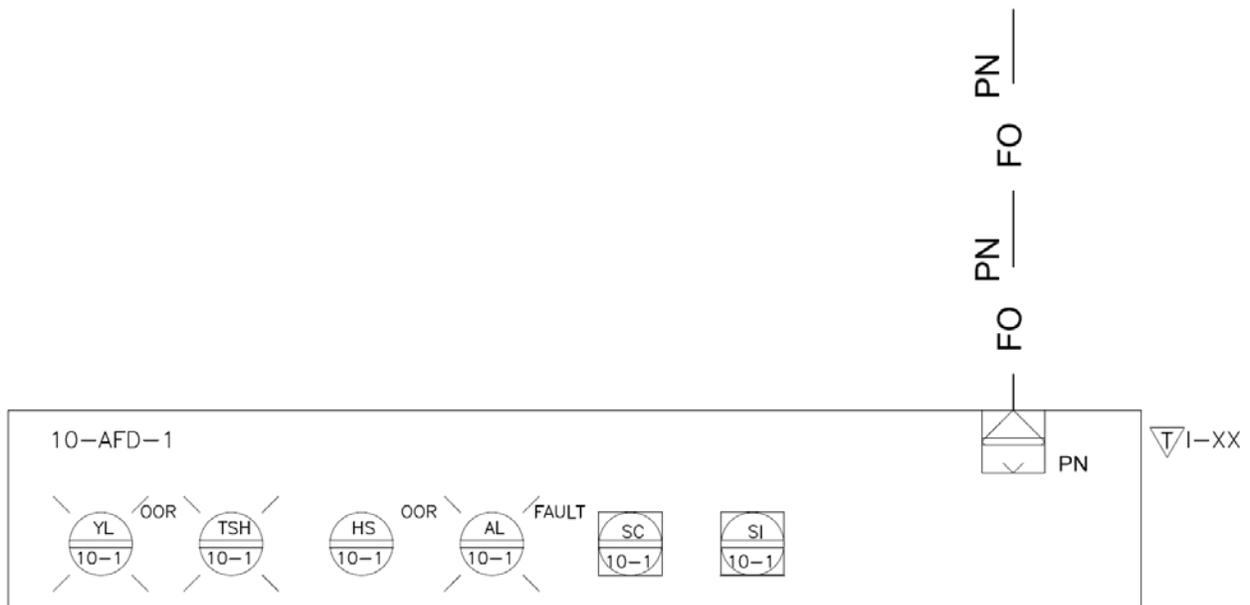
As of Revision 1, Tables have been added.

Any P&ID Symbol with the following designation will imply there is a table attached to the I drawings:



I-XX will contain the drawing location of the table.

SAMPLE DRAWING: STAND ALONE VFD.



1. INDICATING EVENT – OFF, ON, REMOTE
2. INDICATING TEMPERATURE SWITCH HIGH
3. HAND SWITCH – ON, OFF, REMOTE
4. ALARM LIGHT – FAULT
5. SPEED CONTROL
6. SPEED INDICATION
7. PROFINET CONNECTOR
8. PROFINET OVER FIBER
9. TABLE, LOCATED ON I-XX

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Tables will be provided for the following equipment:

1. VFD's
2. FVNR (both soft starters and smart starters i.e. SIMOCODE modules)
3. VALVES
 - a. MODULATING VALVES
 - b. MOTORIZED VALVES
4. VCP's (VARIABLE CONTROL PROCESS)
 - a. BLOWER SYSTEMS (RVSS)
 - b. GRAVITY BELT THICKENERS (GBTs)
 - c. CENTRIFUGE (VFD)
 - d. GBT WASH WATER BOOSTER SYSTEM
 - e. ODOR CONTROL SYSTEM (?)
 - f. PAD SYSTEM
 - g. GRINDERS
 - h. POLYMER DILUTION SYSTEM
 - i. CHEMICAL DOSING PUMPS
5. INSTRUMENTS
 - a. MAGNETIC FLOW METER
 - b. SLUDGE LEVEL
 - c. TURBIDITY
 - d. TOTAL SUSPENDED SOLIDS (TSS)
 - e. PRESSURE
 - f. TEMPERATURE
 - g. WEIGHT
 - h. ULTRASONIC LEVEL
 - i. RADAR LEVEL

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VFD TABLE

VFD - 6/18 PULSE												
PROTOCOL: PROFIBUS/DP												
CONTROL SCHEMATIC: (LOCATION OF P&ID SYMBOL)												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-VFD-XX	XX-VFD-XX.LOCAL				x
LOR - OFF	MODE	.OFFCMD		X		X	XX-VFD-XX	XX-VFD-XX.OFFCMD				x
LOR - REMOTE	MODE	.REMOTE		X			XX-VFD-XX	XX-VFD-XX.REMOTE				x
RUN COMMAND	ACTION	.RUNCMD		X			XX-VFD-XX	XX-VFD-XX.RUNCMD				
RUNNING	STATUS	.RUNNING	X	X	X		XX-VFD-XX	XX-VFD-XX.RUNNING				x
SPEED SETPOINT	CONTROL	.SPEEDCMD		X			XX-VFD-XX	XX-VFD-XX.SPEEDCMD				x
SPEED FEEDBACK	DATA	.SPEED		X	X		XX-VFD-XX	XX-VFD-XX.SPEED	X (LO)			x
SEAL WATER SV	CONTROL	.SEALSV		X			XX-VFD-XX	XX-VFD-XX.SEALSV				
E-STOP PB	ACTION	.ESTOP		X		X	XX-VFD-XX	XX-VFD-XX.ESTOP	X			x
ENABLE	ACTION	.ENABLE		X		X	XX-VFD-XX	XX-VFD-XX.ENABLE				x
FAULT	ALARM	.FAULT	X	X	X	X	XX-VFD-XX	XX-VFD-XX.FAULT	X			x
MOTOR TEMP HI	ALARM	.TAH	X	X	X	X	XX-VFD-XX	XX-VFD-XX.TAH	X			x
DISCH PRESS HI	ALARM	.PAH	X	X	X	X	XX-VFD-XX	XX-VFD-XX.PAH	X			x
SUCT PRESS LO	ALARM	.PAL	X	X	X	X	XX-VFD-XX	XX-VFD-XX.PAL	X			x
SEAL WATER LEAK (IF APPLICABLE)	ALARM	.SEAL_LK_ALM	X	X	X	X	XX-VFD-XX	XX-VFD-XX.SEAL_LK_ALM	X			x
ELAPSED TIME	DATA	.ETIME		X			XX-VFD-XX	XX-VFD-XX.ETIME				
RESET ELAPSED TIME	ACTION	.RSTTIME		X			XX-VFD-XX	XX-VFD-XX.RSTTIME				
DAILY RUN TIME	DATA	.DTIME	X	X			XX-VFD-XX	XX-VFD-XX.DTIME				
TOTAL STARTS	DATA	.TTLSTR	X	X			XX-VFD-XX	XX-VFD-XX.TTLSTR				
DAILY STARTS	DATA	.DSRT	X	X			XX-VFD-XX	XX-VFD-XX.DSRT				
AVERAGE CURRENT	DATA	.MTR-Amps-Avg	X	X			XX-VFD-XX	XX-VFD-XX.MTR-Amps-Avg				x
POWER KVA	DATA	.MTR-Power-KVA	X	X			XX-VFD-XX	XX-VFD-XX.MTR-Power-KVA				x
POWER FACTOR	DATA	.MTR-Power-PF	X	X			XX-VFD-XX	XX-VFD-XX.MTR-Power-PF				x
VOLTAGE	DATA	.VFD-VOLT-In	X	X			XX-VFD-XX	XX-VFD-XX.VFD-VOLT-In				x
Motor CURRENT (AMP)	DATA	.MTR-Amp	X	X	X	X	XX-VFD-XX	XX-VFD-XX.MTR-Amp				x
Motor Power (HP or kW or %)	DATA	.MTR-Power	X	X	X	X	XX-VFD-XX	XX-VFD-XX.MTR-Power				x
Motor Torque (Nm or Lbf-Ft or %)	DATA	.MTR-Torque	X	X	X	X	XX-VFD-XX	XX-VFD-XX.MTR-Torque				x
Motor Speed RPM	DATA	.MTR-RPM	X	X			XX-VFD-XX	XX-VFD-XX.MTR-RPM				x
VFD Heat Sink Temperature (C or F)	DATA	.VFD-HS-Temp	X	X	X	X	XX-VFD-XX	XX-VFD-XX.VFD-HS-Temp	x	x		x
VFD Fault CODE	DATA	.VFD-Fault-CODE	X	X			XX-VFD-XX	XX-VFD-XX.VFD-Fault-CODE	x	x		x
VFD DC BUS VOLTAGE (VDC)	DATA	.VFD-DCBUS-VOLT	X	X	X	X	XX-VFD-XX	XX-VFD-XX.VFD-DCBUS-VOLT	x	x		x

FVNR TABLE

FVNR - MOTORS												
PROTOCOL: PROFIBUS/DP												
CONTROL SCHEMATIC: (LOCATION OF P&ID SYMBOL)												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-FVNR-XX	XX-FVNR-XX.LOCAL				x
LOR - OFF	MODE	.OFFCMD		X		X	XX-FVNR-XX	XX-FVNR-XX.OFFCMD				x
LOR - REMOTE	MODE	.REMOTE		X			XX-FVNR-XX	XX-FVNR-XX.REMOTE				x
RUN COMMAND	ACTION	.RUNCMD		X			XX-FVNR-XX	XX-FVNR-XX.RUNCMD				
RUNNING	STATUS	.RUNNING	X	X	X		XX-FVNR-XX	XX-FVNR-XX.RUNNING				x
E-STOP PB	ACTION	.ESTOP		X		X	XX-FVNR-XX	XX-FVNR-XX.ESTOP				x
FAULT	ALARM	.FAULT	X	X	X	X	XX-FVNR-XX	XX-FVNR-XX.FAULT	X			x
MOTOR TEMP HI	ALARM	.TAH	X	X	X	X	XX-FVNR-XX	XX-FVNR-XX.TAH	X			x
ELAPSED TIME	DATA	.ETIME		X			XX-FVNR-XX	XX-FVNR-XX.ETIME				
RESET ELAPSED TIME	ACTION	.RSTTIME		X			XX-FVNR-XX	XX-FVNR-XX.RSTTIME				
DAILY RUN TIME	DATA	.DTIME	X	X			XX-FVNR-XX	XX-FVNR-XX.DTIME				
TOTAL STARTS	DATA	.TTLSTR	X	X			XX-FVNR-XX	XX-FVNR-XX.TTLSTR				
DAILY STARTS	DATA	.DSRT	X	X			XX-FVNR-XX	XX-FVNR-XX.DSRT				
AVERAGE CURRENT	DATA	.MTR-Amps-Avg	X	X			XX-FVNR-XX	XX-FVNR-XX.MTR-Amps-Avg				x
POWER KVA	DATA	.MTR-Power-KVA	X	X			XX-FVNR-XX	XX-FVNR-XX.MTR-Power-KVA				x
POWER FACTOR	DATA	.MTR-Power-PF	X	X			XX-FVNR-XX	XX-FVNR-XX.MTR-Power-PF				x
VOLTAGE	DATA	.VFD-VOLT-In	X	X			XX-FVNR-XX	XX-FVNR-XX.VFD-VOLT-In				x
Motor CURRENT A (AMP)	DATA	.MTR-Aph-Amp	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-Aph-Amp				x
Motor CURRENT B (AMP)	DATA	.MTR-Bph-Amp	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-Bph-Amp				x
Motor CURRENT C (AMP)	DATA	.MTR-Cph-Amp	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-Cph-Amp				x
Motor Power (HP or kW or %)	DATA	.MTR-Power	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-Power		X low (75%) or high (125%)		x
Motor POWER FACTOR	DATA	.MTR-PF	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-PF				x
Motor VOLTAGE	DATA	.MTR-VOLT	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-VOLT		x (+-6% of 480v)		x
Motor Ground Fault Current	DATA	.MTR-GF-AMP	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-GF-AMP	x	x (3% Value)		x
Overload Fault Code	DATA	.OL-FC		X			XX-FVNR-XX	XX-FVNR-XX.OL-FC	x			

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MODULATING VALVE TABLE

MODULATING VALVE												
PROTOCOL: PROFIBUS/DP												
CONTROL SCHEMATIC: (LOCATION OF P&ID SYMBOL)												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-ZV-XX	XX-ZV-XX.LOCAL			x	
LOR - OFF	MODE	.CMDOFF		X			XX-ZV-XX	XX-ZV-XX.CMDOFF			x	
LOR - REMOTE	MODE	.CMDREM		X			XX-ZV-XX	XX-ZV-XX.CMDREM			x	
OPEN COMMAND	ACTION	.CMDOPN		X			XX-ZV-XX	XX-ZV-XX.CMDOPN				x
CLOSE COMMAND	ACTION	.CMDCLS		X			XX-ZV-XX	XX-ZV-XX.CMDCLS				
STOP COMMAND	ACTION	.CMDSTP		X			XX-ZV-XX	XX-ZV-XX.CMDSTP				
JOG OPEN CMD	ACTION	.JOGOPN		X			XX-ZV-XX	XX-ZV-XX.JOGOPN				
JOG CLOSE CMD	ACTION	.JOGCLS		X			XX-ZV-XX	XX-ZV-XX.JOGCLS				
E-STOP PB	ACTION	.ESTOP		X	X		XX-ZV-XX	XX-ZV-XX.ESTOP	X		x	
RUNNING CLOSED	STATUS	.RUNCLS		X			XX-ZV-XX	XX-ZV-XX.RUNCLS			x	
RUNNING OPEN	STATUS	.RUNOPN		X			XX-ZV-XX	XX-ZV-XX.RUNOPN				
CLOSED LIMIT	STATUS	.CLOSED	X	X		X	XX-ZV-XX	XX-ZV-XX.CLOSED				x
OPENED LIMIT	STATUS	.OPENED	X	X		X	XX-ZV-XX	XX-ZV-XX.OPENED				x
MOVE INHIBITED	STATUS	.MOVEINH		X	X		XX-ZV-XX	XX-ZV-XX.MOVEINH				
SLOW MODE	STATUS	.SLOWMODE		X			XX-ZV-XX	XX-ZV-XX.SLOWMODE				
OPEN LOCKOUT	STATUS	.OPENLOCK		X			XX-ZV-XX	XX-ZV-XX.OPENLOCK			x	
CLOSE LOCKOUT	STATUS	.CLOSELOCK		X			XX-ZV-XX	XX-ZV-XX.CLOSELOCK			x	
POSITION SETPOINT	CONTROL	.POSCMD	X			X	XX-ZV-XX	XX-ZV-XX.POSCMD				x
VALVE POSITION	DATA	.POSITION	X	X	X		XX-ZV-XX	XX-ZV-XX.POSITION				x
RELAY OUTPUT 1	STATUS	.RLY1		X			XX-ZV-XX	XX-ZV-XX.RLY1				
RELAY OUTPUT 2	STATUS	.RLY2		X			XX-ZV-XX	XX-ZV-XX.RLY2				
RELAY OUTPUT 3	STATUS	.RLY3		X			XX-ZV-XX	XX-ZV-XX.RLY3				
RELAY OUTPUT 4	STATUS	.RLY4		X			XX-ZV-XX	XX-ZV-XX.RLY4				
INST. TORQUE	DATA	.INSTORQ	X	X			XX-ZV-XX	XX-ZV-XX.INSTORQ	x			
TORQUE ALARM	ALARM	.HIGHTORQ	X	X	X		XX-ZV-XX	XX-ZV-XX.HIGHTORQ	x			
MOTOR TEMP HI	ALARM	.TAH	X	X	X		XX-ZV-XX	XX-ZV-XX.TAH	x			
OBSTRUCTION	ALARM	.OBSTR	X	X	X		XX-ZV-XX	XX-ZV-XX.OBSTR	x			
WATCHDOG TIMER	ALARM	.WDOG		X	X		XX-ZV-XX	XX-ZV-XX.WDOG	x			
BATTERY LOW	ALARM	.BATFLOW		X	X		XX-ZV-XX	XX-ZV-XX.BATFLOW				
VALVE Actuator FAULT	ALARM	.Actuator-FAULT	x	X	X		XX-ZV-XX	XX-ZV-XX.Actuator-FAULT	x			x
Actuator Torque Value	DATA	.Actuator-Torq	x	x	x		XX-ZV-XX	XX-ZV-XX.Actuator-Torq				x
Actuator FAULT CODE	DATA	.Actuator-FC		X	X		XX-ZV-XX	XX-ZV-XX.Actuator-FC				

MOTORIZED VALVES TABLE

OPEN-CLOSE VALVE												
PROTOCOL: HARD-WIRED I/O												
CONTROL SCHEMATIC: (LOCATION OF P&ID SYMBOL)												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag	
LOR - LOCAL	MODE	.LOCAL		X		XX-ZV-XX	XX-ZV-XX.LOCAL			x		
LOR - OFF	MODE	.CMDOFF		X		XX-ZV-XX	XX-ZV-XX.CMDOFF			x		
LOR - REMOTE	MODE	.CMDREM		X		XX-ZV-XX	XX-ZV-XX.CMDREM			x		
OPEN COMMAND	ACTION	.CMDOPN		X		XX-ZV-XX	XX-ZV-XX.CMDOPN				x	
OPENED LIMIT	STATUS	.OPENED	X	X	X	XX-ZV-XX	XX-ZV-XX.OPENED			x	x	
CLOSED LIMIT	STATUS	.CLOSED	X	X	X	XX-ZV-XX	XX-ZV-XX.CLOSED			x	x	
VALVE Actuator FAULT	ALARM	.Actuator-FAULT	x	X	X	XX-ZV-XX	XX-ZV-XX.Actuator-FAULT	x			x	

OPEN-CLOSE VALVE												
PROTOCOL: PROFIBUS/DP												
CONTROL SCHEMATIC: (LOCATION OF P&ID SYMBOL)												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag	
LOR - LOCAL	MODE	.LOCAL		X		XX-ZV-XX	XX-ZV-XX.LOCAL			x		
LOR - OFF	MODE	.CMDOFF		X		XX-ZV-XX	XX-ZV-XX.CMDOFF			x		
LOR - REMOTE	MODE	.CMDREM		X		XX-ZV-XX	XX-ZV-XX.CMDREM			x	x	
OPEN COMMAND	ACTION	.CMDOPN		X		XX-ZV-XX	XX-ZV-XX.CMDOPN					
CLOSE COMMAND	ACTION	.CMDCLS		X		XX-ZV-XX	XX-ZV-XX.CMDCLS					
OPENED LIMIT	STATUS	.OPENED	X	X	X	XX-ZV-XX	XX-ZV-XX.OPENED			x	x	
CLOSED LIMIT	STATUS	.CLOSED	X	X	X	XX-ZV-XX	XX-ZV-XX.CLOSED			x	x	
VALVE Actuator FAULT	ALARM	.Actuator-FAULT	x	X	X	XX-ZV-XX	XX-ZV-XX.Actuator-FAULT	x			x	

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VCP's (VARIABLE CONTROL PROCESS)

VCPWER SYSTEMS - VCP (RVSS)												
PROTOCOL: PROFIBUS/DP												
CONTROL SCHEMATIC: (LOCATION OF P&ID SYMBOL)												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-RVSS-XX	XX-RVSS-XX.LOCAL			x	
LOR - OFF	MODE	.OFFCMD		X		X	XX-RVSS-XX	XX-RVSS-XX.OFFCMD			x	
LOR - REMOTE	MODE	.REMOTE		X			XX-RVSS-XX	XX-RVSS-XX.REMOTE			x	
FAULT RESET	ACTION	RSTFAULT		X			XX-RVSS-XX	XX-RVSS-XX.RSTFAULT			x	
START	ACTION	START		X			XX-RVSS-XX	XX-RVSS-XX.START			x	
STOP	ACTION	STOP		X		X	XX-RVSS-XX	XX-RVSS-XX.STOP			x	
VCPWER FLOW	DATA	CMDBLRFLOW		X			XX-RVSS-XX	XX-RVSS-XX.CMDBLRFLOW				
VCPWER SPEED	CONTROL	CMDBLRSPEED		X			XX-RVSS-XX	XX-RVSS-XX.CMDBLRSPEED				
RUNNING	STATUS	RUNNING	X	X	X		XX-RVSS-XX	XX-RVSS-XX.RUNNING			x	x
POWER ON	STATUS	PWRON		X			XX-RVSS-XX	XX-RVSS-XX.PWRON			x	
VCPWER SPEED	DATA	SPEED	X	X	X		XX-RVSS-XX	XX-RVSS-XX.SPEED				x
FLOW	DATA	FLOW	X	X	X		XX-RVSS-XX	XX-RVSS-XX.FLOW				x
INLET TEMPERATURE	DATA	INTEMP	X	X	X		XX-RVSS-XX	XX-RVSS-XX.INTEMP				x
INLET PRESSURE	DATA	INPRESS	X	X	X		XX-RVSS-XX	XX-RVSS-XX.INPRESS				x
OUTLET TEMPERATURE	DATA	DISTEMP	X	X	X		XX-RVSS-XX	XX-RVSS-XX.DISTEMP				x
OUTLET PRESSURE	DATA	DISPRESS	X	X	X		XX-RVSS-XX	XX-RVSS-XX.DISPRESS				x
TOTAL STARTS	DATA	TTLSTR	X	X			XX-RVSS-XX	XX-RVSS-XX.TTLSTR				
ELAPSED TIME	DATA	ETIME	X	X			XX-RVSS-XX	XX-RVSS-XX.ETIME			x	
FAIL TO RESPOND	ALARM	FAILRPND	X	X		X	XX-RVSS-XX	XX-RVSS-XX.FAILRPND	x			
COMMON WARNING	ALARM	.WARNING		X			XX-RVSS-XX	XX-RVSS-XX.WARNING		x		
E-STOP PRESSED	ACTION	.ESTOP		X		X	XX-RVSS-XX	XX-RVSS-XX.ESTOP	x			
AVERAGE CURRENT	DATA	.MTR-Amps-Avg	X	X			XX-RVSS-XX	XX-RVSS-XX.MTR-Amps-Avg				x
POWER KVA	DATA	.MTR-Power-KVA	X	X			XX-RVSS-XX	XX-RVSS-XX.MTR-Power-KVA				x
POWER FACTOR	DATA	.MTR-Power-PF	X	X			XX-RVSS-XX	XX-RVSS-XX.MTR-Power-PF				x
VOLTAGE	DATA	.VCP-VOLT-In	X	X			XX-RVSS-XX	XX-RVSS-XX.VCP-VOLT-In				x
Motor CURRENT A (AMP)	DATA	.MTR-Aph-Amp	X	X	X		XX-RVSS-XX	XX-RVSS-XX.MTR-Aph-Amp				x
Motor CURRENT B (AMP)	DATA	.MTR-Bph-Amp	X	X	X		XX-RVSS-XX	XX-RVSS-XX.MTR-Bph-Amp				x
Motor CURRENT C (AMP)	DATA	.MTR-Cph-Amp	X	X	X		XX-RVSS-XX	XX-RVSS-XX.MTR-Cph-Amp				x
Motor Power (HP or kW or %)	DATA	.MTR-Power	X	X	X		XX-RVSS-XX	XX-RVSS-XX.MTR-Power		X low (75%) or high (125%)		x
Motor POWER FACTOR	DATA	.MTR-PF	X	X	X		XX-RVSS-XX	XX-RVSS-XX.MTR-PF				x
Motor VOLTAGE	DATA	.MTR-VOLT	X	X	X		XX-RVSS-XX	XX-RVSS-XX.MTR-VOLT				x
RVSS Fault Code	DATA	.RVSS-FC	X	X			XX-RVSS-XX	XX-RVSS-XX.RVSS-FC		x (+6% of 480v)		x
COMMON ALARM	ALARM	.FAULT	X	X		X	XX-RVSS-XX	XX-RVSS-XX.FAULT	x			x

GRAVITY BELT THICKENERS (GBTs) - VCP												
PROTOCOL: PROFINET												
CONTROL SCHEMATIC: BY VENDOR												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-VCP-XX	XX-VCP-XX.LOCAL			x	
LOR - OFF	MODE	.OFFCMD		X		X	XX-VCP-XX	XX-VCP-XX.OFFCMD			x	
LOR - REMOTE	MODE	.REMOTE		X			XX-VCP-XX	XX-VCP-XX.REMOTE			x	
FAULT RESET	ACTION	RSTFAULT		X			XX-VCP-XX	XX-VCP-XX.RSTFAULT			x	
START	ACTION	START		X			XX-VCP-XX	XX-VCP-XX.START			x	
STOP	ACTION	STOP		X		X	XX-VCP-XX	XX-VCP-XX.STOP			x	
VCPWER FLOW	DATA	CMDBLRFLOW		X			XX-VCP-XX	XX-VCP-XX.CMDBLRFLOW				
VCPWER SPEED	CONTROL	CMDBLRSPEED		X			XX-VCP-XX	XX-VCP-XX.CMDBLRSPEED				
RUNNING	STATUS	RUNNING	X	X	X		XX-VCP-XX	XX-VCP-XX.RUNNING			x	x
POWER ON	STATUS	PWRON		X			XX-VCP-XX	XX-VCP-XX.PWRON			x	
VCPWER SPEED	DATA	SPEED	X	X	X		XX-VCP-XX	XX-VCP-XX.SPEED				x
FLOW	DATA	FLOW	X	X	X		XX-VCP-XX	XX-VCP-XX.FLOW				x
INLET TEMPERATURE	DATA	INTEMP	X	X	X		XX-VCP-XX	XX-VCP-XX.INTEMP				x
INLET PRESSURE	DATA	INPRESS	X	X	X		XX-VCP-XX	XX-VCP-XX.INPRESS				x
OUTLET TEMPERATURE	DATA	DISTEMP	X	X	X		XX-VCP-XX	XX-VCP-XX.DISTEMP				x
OUTLET PRESSURE	DATA	DISPRESS	X	X	X		XX-VCP-XX	XX-VCP-XX.DISPRESS				x
TOTAL STARTS	DATA	TTLSTR	X	X			XX-VCP-XX	XX-VCP-XX.TTLSTR				
ELAPSED TIME	DATA	ETIME	X	X			XX-VCP-XX	XX-VCP-XX.ETIME			x	
FAIL TO RESPOND	ALARM	FAILRPND	X	X		X	XX-VCP-XX	XX-VCP-XX.FAILRPND	x			
COMMON WARNING	ALARM	.WARNING		X			XX-VCP-XX	XX-VCP-XX.WARNING		x		
E-STOP PRESSED	ACTION	.ESTOP		X		X	XX-VCP-XX	XX-VCP-XX.ESTOP	x			
AVERAGE CURRENT	DATA	.MTR-Amps-Avg	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Amps-Avg				x
POWER KVA	DATA	.MTR-Power-KVA	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Power-KVA				x
POWER FACTOR	DATA	.MTR-Power-PF	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Power-PF				x
VOLTAGE	DATA	.VCP-VOLT-In	X	X			XX-VCP-XX	XX-VCP-XX.VCP-VOLT-In				x
Motor CURRENT (AMP)	DATA	.MTR-Amp	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-Amp				x
Motor Power (HP or kW or %)	DATA	.MTR-Power	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-Power				x
Motor Torque (Nm or lbf-ft or %)	DATA	.MTR-Torque	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-Torque				x
Motor Speed RPM	DATA	.MTR-RPM	X	X			XX-VCP-XX	XX-VCP-XX.MTR-RPM				x
VFD Heat Sink Temperature (C or F)	DATA	.VFD-HS-Temp	X	X	X	X	XX-VCP-XX	XX-VCP-XX.VFD-HS-Temp	x			x
VFD Fault CODE	DATA	.VFD-Fault-CODE	X	X			XX-VCP-XX	XX-VCP-XX.VFD-Fault-CODE	x			x
VFD DC BUS VOLTAGE (VDC)	DATA	.VFD-DCBUS-VOLT	X	X	X	X	XX-VCP-XX	XX-VCP-XX.VFD-DCBUS-VOLT	x			x
COMMON ALARM	ALARM	.FAULT	X	X		X	XX-VCP-XX	XX-VCP-XX.FAULT	x			x

VCPTRFUGE - VCP (VFDs)												
PROTOCOL: PROFINET												
CONTROL SCHEMATIC: BY VENDOR												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-VFD-XX	XX-VFD-XX.LOCAL			x	
LOR - OFF	MODE	.OFFCMD		X		X	XX-VFD-XX	XX-VFD-XX.OFFCMD			x	
LOR - REMOTE	MODE	.REMOTE		X			XX-VFD-XX	XX-VFD-XX.REMOTE			x	
FAULT RESET	ACTION	RSTFAULT		X			XX-VFD-XX	XX-VFD-XX.RSTFAULT			x	
START	ACTION	START		X			XX-VFD-XX	XX-VFD-XX.START			x	
STOP	ACTION	STOP		X		X	XX-VFD-XX	XX-VFD-XX.STOP			x	
VCPWER FLOW	DATA	CMDBLRFLOW		X			XX-VFD-XX	XX-VFD-XX.CMDBLRFLOW				
VCPWER SPEED	CONTROL	CMDBLRSPEED		X			XX-VFD-XX	XX-VFD-XX.CMDBLRSPEED				
RUNNING	STATUS	RUNNING	X	X	X		XX-VFD-XX	XX-VFD-XX.RUNNING			x	x
POWER ON	STATUS	PWRON		X			XX-VFD-XX	XX-VFD-XX.PWRON			x	
VCPWER SPEED	DATA	SPEED	X	X	X		XX-VFD-XX	XX-VFD-XX.SPEED				x
FLOW	DATA	FLOW	X	X	X		XX-VFD-XX	XX-VFD-XX.FLOW				x
INLET TEMPERATURE	DATA	INTEMP	X	X	X		XX-VFD-XX	XX-VFD-XX.INTEMP				x
INLET PRESSURE	DATA	INPRESS	X	X	X		XX-VFD-XX	XX-VFD-XX.INPRESS				x
OUTLET TEMPERATURE	DATA	DISTEMP	X	X	X		XX-VFD-XX	XX-VFD-XX.DISTEMP				x
OUTLET PRESSURE	DATA	DISPRESS	X	X	X		XX-VFD-XX	XX-VFD-XX.DISPRESS				x
TOTAL STARTS	DATA	TTLSTR	X	X			XX-VFD-XX	XX-VFD-XX.TTLSTR				
ELAPSED TIME	DATA	ETIME	X	X			XX-VFD-XX	XX-VFD-XX.ETIME			x	
FAIL TO RESPOND	ALARM	FAILRPND	X	X		X	XX-VFD-XX	XX-VFD-XX.FAILRPND	x			
COMMON WARNING	ALARM	.WARNING		X			XX-VFD-XX	XX-VFD-XX.WARNING		x		
E-STOP PRESSED	ACTION	.ESTOP		X		X	XX-VFD-XX	XX-VFD-XX.ESTOP	x			
AVERAGE CURRENT	DATA	.MTR-Amps-Avg	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Amps-Avg				x
POWER KVA	DATA	.MTR-Power-KVA	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Power-KVA				x
POWER FACTOR	DATA	.MTR-Power-PF	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Power-PF				x
VOLTAGE	DATA	.VCP-VOLT-In	X	X			XX-VCP-XX	XX-VCP-XX.VCP-VOLT-In				x
Motor CURRENT (AMP)	DATA	.MTR-Amp	X	X	X		XX-VFD-XX	XX-VFD-XX.MTR-Amp				x
Motor Power (HP or kW or %)	DATA	.MTR-Power	X	X	X		XX-VFD-XX	XX-VFD-XX.MTR-Power				x
Motor Torque (Nm or lbf-ft or %)	DATA	.MTR-Torque	X	X	X		XX-VFD-XX	XX-VFD-XX.MTR-Torque				x
Motor Speed RPM	DATA	.MTR-RPM	X	X			XX-VFD-XX	XX-VFD-XX.MTR-RPM				x
VFD Heat Sink Temperature (C or F)	DATA	.VFD-HS-Temp	X	X	X	X	XX-VFD-XX	XX-VFD-XX.VFD-HS-Temp	x			x
VFD Fault CODE	DATA	.VFD-Fault-CODE	X	X			XX-VFD-XX	XX-VFD-XX.VFD-Fault-CODE	x			x
VFD DC BUS VOLTAGE (VDC)	DATA	.VFD-DCBUS-VOLT	X	X	X	X	XX-VFD-XX	XX-VFD-XX.VFD-DCBUS-VOLT	x			x
COMMON ALARM	ALARM	.FAULT	X	X		X	XX-VFD-XX	XX-VFD-XX.FAULT	x			x

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GBT WASH WATER BOOSTER SYSTEM - VCP												
PROTOCOL: PROFINET												
MONITORING / CONTROL												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-VCP-XX	XX-VCP-XX.LOCAL			x	
LOR - OFF	MODE	.OFFCMD		X		X	XX-VCP-XX	XX-VCP-XX.OFFCMD			x	
LOR - REMOTE	MODE	.REMOTE		X			XX-VCP-XX	XX-VCP-XX.REMOTE			x	
RUN COMMAND	ACTION	.RUNCMD		X			XX-VCP-XX	XX-VCP-XX.RUNCMD			x	
RUNNING	STATUS	.RUNNING	X	X	X		XX-VCP-XX	XX-VCP-XX.RUNNING				x
E-STOP PB	ACTION	.ESTOP		X		X	XX-VCP-XX	XX-VCP-XX.ESTOP	x			x
FAULT	ALARM	.FAULT	X	X		X	XX-VCP-XX	XX-VCP-XX.FAULT	x			x
ELAPSED TIME	DATA	.ETIME		X			XX-VCP-XX	XX-VCP-XX.ETIME				
RESET ELAPSED TIME	ACTION	.RSTTIME		X			XX-VCP-XX	XX-VCP-XX.RSTTIME				
DAILY RUN TIME	DATA	.DTIME	X	X			XX-VCP-XX	XX-VCP-XX.DTIME				
TOTAL STARTS	DATA	.TTLSTR	X	X			XX-VCP-XX	XX-VCP-XX.TTLSTR				
DAILY STARTS	DATA	.DSRT	X	X			XX-VCP-XX	XX-VCP-XX.DSRT				
AVERAGE CURRENT	DATA	.MTR-Amps-Avg	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Amps-Avg				x
POWER KVA	DATA	.MTR-Power-KVA	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Power-KVA				x
POWER FACTOR	DATA	.MTR-Power-PF	X	X			XX-VCP-XX	XX-VCP-XX.MTR-Power-PF				x
VOLTAGE	DATA	.VCP-VOLT-In	X	X			XX-VCP-XX	XX-VCP-XX.VCP-VOLT-In				x
Motor CURRENT A (AMP)	DATA	.MTR-Aph-Amp	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-Aph-Amp				x
Motor CURRENT B (AMP)	DATA	.MTR-Bph-Amp	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-Bph-Amp				x
Motor CURRENT C (AMP)	DATA	.MTR-Cph-Amp	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-Cph-Amp				x
Motor Power (HP or kW or %)	DATA	.MTR-Power	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-Power		X low (75%) or high (125%)		x
Motor POWER FACTOR	DATA	.MTR-PF	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-PF				x
Motor VOLTAGE	DATA	.MTR-VOLT	X	X	X		XX-VCP-XX	XX-VCP-XX.MTR-VOLT		x (+6% of 480v)		x
Motor Ground Fault Current	DATA	.MTR-GF-AMP	X	X	X	X	XX-VCP-XX	XX-VCP-XX.MTR-GF-AMP	x	x (3% Value)		x
Overload Fault Code	DATA	.OL-FC		X		X	XX-VCP-XX	XX-VCP-XX.OL-FC	x			

ODOR CONTROL SYSTEM - VCP (FVNR)												
PROTOCOL: PROFINET												
CONTROL SCHEMATIC: BY VENDOR												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-FVNR-XX	XX-FVNR-XX.LOCAL			x	
LOR - OFF	MODE	.OFFCMD		X		X	XX-FVNR-XX	XX-FVNR-XX.OFFCMD			x	
LOR - REMOTE	MODE	.REMOTE		X			XX-FVNR-XX	XX-FVNR-XX.REMOTE			x	
FAULT RESET	ACTION	.RSTFAULT		X			XX-FVNR-XX	XX-FVNR-XX.RSTFAULT			x	
START	ACTION	.START		X			XX-FVNR-XX	XX-FVNR-XX.START			x	
STOP	ACTION	.STOP		X		X	XX-FVNR-XX	XX-FVNR-XX.STOP			x	
VCPWATER FLOW	DATA	.CMBDLRFLW	X	X			XX-FVNR-XX	XX-FVNR-XX.CMBDLRFLW				x
VCPWATER SPEED	CONTROL	.CMBDLRSPEED	X	X			XX-FVNR-XX	XX-FVNR-XX.CMBDLRSPEED				x
RUNNING	STATUS	.RUNNING	X	X	X		XX-FVNR-XX	XX-FVNR-XX.RUNNING				x
POWER ON	STATUS	.PWIRON	X	X			XX-FVNR-XX	XX-FVNR-XX.PWIRON				x
VCPWATER SPEED	DATA	.SPEED	X	X	X		XX-FVNR-XX	XX-FVNR-XX.SPEED				x
FLOW	DATA	.FLOW	X	X	X		XX-FVNR-XX	XX-FVNR-XX.FLOW				x
INLET TEMPERATURE	DATA	.INTEMP	X	X	X		XX-FVNR-XX	XX-FVNR-XX.INTEMP				x
INLET PRESSURE	DATA	.INPRESS	X	X	X		XX-FVNR-XX	XX-FVNR-XX.INPRESS				x
OUTLET TEMPERATURE	DATA	.DISTEMP	X	X	X		XX-FVNR-XX	XX-FVNR-XX.DISTEMP				x
OUTLET PRESSURE	DATA	.DISPRESS	X	X	X		XX-FVNR-XX	XX-FVNR-XX.DISPRESS				x
TOTAL STARTS	DATA	.TTLSTR	X	X			XX-FVNR-XX	XX-FVNR-XX.TTLSTR				
ELAPSED TIME	DATA	.ETIME	X	X			XX-FVNR-XX	XX-FVNR-XX.ETIME				x
FAIL TO RESPOND	ALARM	.FAILRPND	X	X		X	XX-FVNR-XX	XX-FVNR-XX.FAILRPND	x			
COMMON WARNING	ALARM	.WARNING	X	X		X	XX-FVNR-XX	XX-FVNR-XX.WARNING		x		
E-STOP PRESSED	ACTION	.ESTOP		X		X	XX-FVNR-XX	XX-FVNR-XX.ESTOP	x			
AVERAGE CURRENT	DATA	.MTR-Amps-Avg	X	X			XX-FVNR-XX	XX-FVNR-XX.MTR-Amps-Avg				x
POWER KVA	DATA	.MTR-Power-KVA	X	X			XX-FVNR-XX	XX-FVNR-XX.MTR-Power-KVA				x
POWER FACTOR	DATA	.MTR-Power-PF	X	X			XX-FVNR-XX	XX-FVNR-XX.MTR-Power-PF				x
VOLTAGE	DATA	.VCP-VOLT-In	X	X			XX-FVNR-XX	XX-FVNR-XX.VCP-VOLT-In				x
Motor CURRENT A (AMP)	DATA	.MTR-Aph-Amp	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-Aph-Amp				x
Motor CURRENT B (AMP)	DATA	.MTR-Bph-Amp	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-Bph-Amp				x
Motor CURRENT C (AMP)	DATA	.MTR-Cph-Amp	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-Cph-Amp				x
Motor Power (HP or kW or %)	DATA	.MTR-Power	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-Power		X low (75%) or high (125%)		x
Motor POWER FACTOR	DATA	.MTR-PF	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-PF				x
Motor VOLTAGE	DATA	.MTR-VOLT	X	X	X		XX-FVNR-XX	XX-FVNR-XX.MTR-VOLT		x (+6% of 480v)		x
Motor Ground Fault Current	DATA	.MTR-GF-AMP	X	X	X	X	XX-FVNR-XX	XX-FVNR-XX.MTR-GF-AMP	x	x (+6% of 480v)		x
Overload Fault Code	DATA	.OL-FC		X		X	XX-FVNR-XX	XX-FVNR-XX.OL-FC	x	x (3% Value)		
COMMON ALARM	ALARM	.FAULT	X	X	X	X	XX-FVNR-XX	XX-FVNR-XX.FAULT	x			x

PAD SYSTEM - VCP												
PROTOCOL: PROFINET												
CONTROL SCHEMATIC: BY VENDOR												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
DISSOLVED OXYGEN - 1	DATA	.DO1	X	X	X		XX-TNK-XX	XX-TNK-XX.DO1				x
TEMPERATURE - 1	DATA	.TEMP1	X	X	X		XX-TNK-XX	XX-TNK-XX.TEMP1				x
PH - 1	DATA	.PH1	X	X	X		XX-TNK-XX	XX-TNK-XX.PH1				x
DISSOLVED OXYGEN - 2	DATA	.DO2	X	X	X		XX-TNK-XX	XX-TNK-XX.DO2				x
TEMPERATURE - 2	DATA	.TEMP2	X	X	X		XX-TNK-XX	XX-TNK-XX.TEMP2				x
PH - 2	DATA	.PH2	X	X	X		XX-TNK-XX	XX-TNK-XX.PH2				x
INLET AIR FLOW	DATA	.AIRFLOW	X	X	X		XX-TNK-XX	XX-TNK-XX.AIRFLOW				x
PAD TANK TEMP.	DATA	.TNKTEMP	X	X	X		XX-TNK-XX	XX-TNK-XX.TNKTEMP				x
COMMON WARNING	ALARM	.WARNING	X	X			XX-TNK-XX	XX-TNK-XX.WARNING		x		x
E-STOP PRESSED	ACTION	.ESTOP		X		X	XX-TNK-XX	XX-TNK-XX.ESTOP	x			x
COMMON ALARM	ALARM	.FAULT	X	X	X	X	XX-TNK-XX	XX-TNK-XX.FAULT	x			x

VCPIDERS - VCP												
PROTOCOL: HARDWIRED I/O												
CONTROL SCHEMATIC: BY VENDOR												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-VCP-XX	XX-VCP-XX.LOCAL				x
LOR - OFF	MODE	.OFFCMD		X		X	XX-VCP-XX	XX-VCP-XX.OFFCMD				x
LOR - REMOTE	MODE	.REMOTE		X			XX-VCP-XX	XX-VCP-XX.REMOTE				x
RUN COMMAND	ACTION	.RUNCMD		X		X	XX-VCP-XX	XX-VCP-XX.RUNCMD				x
RUNNING	STATUS	.RUNNING	X	X	X		XX-VCP-XX	XX-VCP-XX.RUNNING				x
FAILED	ALARM	.FAILED	X	X	X	X	XX-VCP-XX	XX-VCP-XX.FAILED	x			x

POLYMER VCPUSTION SYSTEMS - VCP												
PROTOCOL: PROFIBUS/DP												
CONTROL SCHEMATIC: BY VENDOR												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LOR - LOCAL	MODE	.LOCAL		X			XX-VCP-XX	XX-VCP-XX.LOCAL				x
LOR - OFF	MODE	.OFFCMD		X		X	XX-VCP-XX	XX-VCP-XX.OFFCMD				x
LOR - REMOTE	MODE	.REMOTE		X			XX-VCP-XX	XX-VCP-XX.REMOTE				x
RUN COMMAND	ACTION	.RUNCMD		X		X	XX-VCP-XX	XX-VCP-XX.RUNCMD				x
RUNNING	STATUS	.RUNNING	X	X	X		XX-VCP-XX	XX-VCP-XX.RUNNING				x
SPEED SETPOINT	CONTROL	.SPEEDCMD		X	X		XX-VCP-XX	XX-VCP-XX.SPEEDCMD				x
SPEED FEEDBACK	DATA	.SPEED	X	X	X		XX-VCP-XX	XX-VCP-XX.SPEED				x
MIXER	STATUS	.MIXR	X	X		X	XX-VCP-XX	XX-VCP-XX.MIXR	x			x
Pump Fault Code	DATA	.OL-FC		X		X	XX-VCP-XX	XX-VCP-XX.OL-FC	x			
Pump Fault	ALARM	.FAULT	X	X	X	X	XX-VCP-XX	XX-VCP-XX.FAULT	x			x

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CHEMICAL DOSING PUMPS - VCP												
PROTOCOL: PROFIBUS/DP												
CONTROL SCHEMATIC: BY VENDOR												
DESCRIPTION	TYPE	TAG SUFFIX	HISTORIZE	INDICATE	TREND	INTERLOCK	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
HOA - LOCAL	MODE	.LOCAL		X			XX-VCP-XX	XX-VCP-XX.LOCAL			X	
HOA - OFF	MODE	.OFFCMD		X			XX-VCP-XX	XX-VCP-XX.OFFCMD			X	
HOA - REMOTE	MODE	.REMOTE		X			XX-VCP-XX	XX-VCP-XX.REMOTE			X	
RUN COMMAND	ACTION	.RUNCMD		X		X	XX-VCP-XX	XX-VCP-XX.RUNCMD			X	
RUNNING	STATUS	.RUNNING	X	X	X		XX-VCP-XX	XX-VCP-XX.RUNNING				X
SPEED SETPOINT	CONTROL	.SPEEDCMD		X	X		XX-VCP-XX	XX-VCP-XX.SPEEDCMD				
SPEED FEEDBACK	DATA	.SPEED		X	X	X	XX-VCP-XX	XX-VCP-XX.SPEED	X			
Pump Fault Code	DATA	.OL-FC		X		X	XX-VCP-XX	XX-VCP-XX.OL-FC	X			
Pump Fault	ALARM	.FAULT	X	X	X	X	XX-VCP-XX	XX-VCP-XX.FAULT	X			X

INSTRUMENTS

MAGNETIC FLOW METER											
PROTOCOL: PROFIBUS/DP											
MONITORING											
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag	
VOLUME FLOW	.VOLFLOW	X	X	X	XX-FIT-XXX	XX-FIT-XXX.VOLFLOW	X			X	
FLOW TOTALIZER 1	.FLOWTOT1	X	X	X	XX-FIT-XXX	XX-FIT-XXX.FLOWTOT1				X	
FLOW TOTALIZER 2	.FLOWTOT2	X	X	X	XX-FIT-XXX	XX-FIT-XXX.FLOWTOT2					
FLOW TOTALIZER 3	.FLOWTOT3	X	X	X	XX-FIT-XXX	XX-FIT-XXX.FLOWTOT3					
MAINTENANCE REQUIRED	.MAINTREQ	X			XX-FIT-XXX	XX-FIT-XXX.MAINTREQ	X				
SOFTWARE FAILURE	.FAILSOFT				XX-FIT-XXX	XX-FIT-XXX.FAILSOFT	X				
MEASUREMENT FAILURE	.FAILMEAS	X			XX-FIT-XXX	XX-FIT-XXX.FAILMEAS	X				
HARDWARE FAILURE	.FAILHARD				XX-FIT-XXX	XX-FIT-XXX.FAILHARD	X				
COMMUNICATION FAILURE	.FAILCOMM	X			XX-FIT-XXX	XX-FIT-XXX.FAILCOMM	X				
Flow velocity	.FLOW-VEL	X		X	XX-FIT-XXX	XX-FIT-XXX.FLOW-VEL				X	
Conductivity	.FLOW-COND	X	X	X	XX-FIT-XXX	XX-FIT-XXX.FLOW-COND				X	
Temperature	.FLOW-TEMP			X	XX-FIT-XXX	XX-FIT-XXX.FLOW-TEMP				X	
Electronics temperature	.MAG-TEMP		X	X	XX-FIT-XXX	XX-FIT-XXX.MAG-TEMP				X	
Noise	.MAG-NOISE		X	X	XX-FIT-XXX	XX-FIT-XXX.MAG-NOISE				X	
Coil current rise time	.MAG-COIL-CURR		X	X	XX-FIT-XXX	XX-FIT-XXX.MAG-COIL-CURR	X			X	
FLOWMETER FAULT CODE	.MAG-FC		X		XX-FIT-XXX	XX-FIT-XXX.MAG-FC	X		X		

SLUDGE LEVEL (HACH Sonatex SC)											
PROTOCOL: PROFIBUS DB											
MONITORING											
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag	
SLUDGE LEVEL (ft)	.SLG-LEVEL	X	X	X	XX-FIT-XXX	XX-FIT-XXX.SLG-LEVEL				X	
Wipe STS	.SLG-WIPER		X		XX-FIT-XXX	XX-FIT-XXX.SLG-WIPER					
Error	.SLG-ERROR		X		XX-FIT-XXX	XX-FIT-XXX.SLG-ERROR	X				
TEST / MAINT DATE	.SLG-LASTDATE		X		XX-FIT-XXX	XX-FIT-XXX.SLG-LASTDATE					
MOIST SENESOR	.SLG-MOIST		X	X	XX-FIT-XXX	XX-FIT-XXX.SLG-MOIST					
Temperature (C)	.SLG-TEMP		X	X	XX-FIT-XXX	XX-FIT-XXX.SLG-TEMP					
Sensor angle	.SLG-SEN-Deg		X	X	XX-FIT-XXX	XX-FIT-XXX.SLG-SEN-Deg					
Frequency (hz)	.SLG-RES-HZ		X	X	XX-FIT-XXX	XX-FIT-XXX.SLG-RES-HZ					
Ampl Diag (Volts)	.SLG-AMPL		X	X	XX-FIT-XXX	XX-FIT-XXX.SLG-AMPL					

TURBIDITY SOLITAX sc											
PROTOCOL: PROFIBUS DP											
MONITORING											
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag	
TURBIDITY NTU	.SLTX_NTU	X	X	X	XX-FIT-XXX	XX-FIT-XXX.SLTX_NTU	X			X	
SOLID mg/L	.SLTX_EBC	X	X	X	XX-FIT-XXX	XX-FIT-XXX.SLTX_EBC	X			X	
CALibration DATE	.SLTX_cal_Date		X		XX-FIT-XXX	XX-FIT-XXX.SLTX_cal_Date					
Cal TURBIDITY	.SLTX_cal_NTU		X		XX-FIT-XXX	XX-FIT-XXX.SLTX_cal_NTU					
Cal Solid	.SLTX_cal_Solid		X		XX-FIT-XXX	XX-FIT-XXX.SLTX_cal_Solid					
Signal LED	.SLTX_Sig_LED		X		XX-FIT-XXX	XX-FIT-XXX.SLTX_Sig_LED					
Signal Moist	.SLTX_Sig_Moist		X		XX-FIT-XXX	XX-FIT-XXX.SLTX_Sig_Moist					
Error Code	.SLTX_Sig_LED_EC		X		XX-FIT-XXX	XX-FIT-XXX.SLTX_Sig_LED_EC	X				

TOTAL SUSPENDED SOLIDS (TSS) Hach TSS EX1 sc											
PROTOCOL: PROFIBUS DP											
MONITORING											
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag	
TURBIDITY NTU	.TSS_NTU	X	X	X	XX-AIT-XXX	XX-AIT-XXX.TSS_NTU	X			X	
SOLID mg/L	.TSS_EBC	X	X	X	XX-AIT-XXX	XX-AIT-XXX.TSS_EBC	X			X	
CALibration DATE	.TSS_cal_Date		X		XX-AIT-XXX	XX-AIT-XXX.TSS_cal_Date					
Cal TURBIDITY	.TSS_cal_NTU		X		XX-AIT-XXX	XX-AIT-XXX.TSS_cal_NTU					
Cal Solid	.TSS_cal_Solid		X		XX-AIT-XXX	XX-AIT-XXX.TSS_cal_Solid					
S5E1	.TSS_Sig_LED_S5E1		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_S5E1					
S5E2	.TSS_Sig_LED_S5E2		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_S5E2					
S5E3	.TSS_Sig_LED_S5E3		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_S5E3					
S5E4	.TSS_Sig_LED_S5E4		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_S5E4					
S5E1	.TSS_Sig_LED_S5E1		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_S5E1					
S5E2	.TSS_Sig_LED_S5E2		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_S5E2					
S5E3	.TSS_Sig_LED_S5E3		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_S5E3					
S5E4	.TSS_Sig_LED_S5E4		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_S5E4					
Error Code	.TSS_Sig_LED_EC		X		XX-AIT-XXX	XX-AIT-XXX.TSS_Sig_LED_EC					

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PRESSURE										
PROTOCOL: 4-20mA										
MONITORING										
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
PRESSURE	.PRESS	X	X	X	XX-PIT-XXX	XX-TIT-XXX.PRESS				X
High Eng Value	.100PERC		X		XX-PIT-XXX	XX-TIT-XXX.100PERC				
Low Eng Value	.ZEROPERC		X		XX-PIT-XXX	XX-TIT-XXX.ZEROPERC				
Open Circuit	.FAIL-OPEN	X	X		XX-PIT-XXX	XX-TIT-XXX.FAIL-OPEN	X			
Short Circuit	.FAIL_Short	X	X		XX-PIT-XXX	XX-TIT-XXX.FAIL_Short	X			

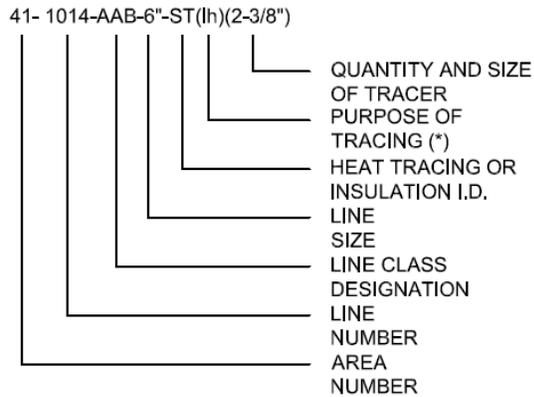
TEMPERATURE										
PROTOCOL: 4-20mA										
MONITORING										
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
TEMPERATURE	.Temp	X	X	X	XX-TIT-XXX	XX-TIT-XXX.Temp				X
High Eng Value	.100PERC		X		XX-TIT-XXX	XX-TIT-XXX.100PERC				
Low Eng Value	.ZEROPERC		X		XX-TIT-XXX	XX-TIT-XXX.ZEROPERC				
Open Circuit	.FAIL-OPEN	X	X		XX-TIT-XXX	XX-TIT-XXX.FAIL-OPEN	X			
Short Circuit	.FAIL_Short	X	X		XX-TIT-XXX	XX-TIT-XXX.FAIL_Short	X			

WEIGHT										
PROTOCOL: PROFIBUS/DP										
MONITORING										
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
NET AMOUNT	.NETAMNT	X	X		XX-WIT-XXX	XX-WIT-XXX.NETAMNT				X
FEED RATE	.FEEDRATE	X		X	XX-WIT-XXX	XX-WIT-XXX.FEEDRATE				X
DAILY USED	.DAILYUSED	X	X	X	XX-WIT-XXX	XX-WIT-XXX.DAILYUSED				
DAYS UNTIL EMPTY	.DAYSEMPY		X		XX-WIT-XXX	XX-WIT-XXX.DAYSEMPY				
AMOUNT USED	.AMOUNTUSED		X		XX-WIT-XXX	XX-WIT-XXX.AMOUNTUSED				
PERCENT FULL	.PERCFULL		X		XX-WIT-XXX	XX-WIT-XXX.PERCFULL				
BASE NET AMOUNT	.BASENETAMOUNT				XX-WIT-XXX	XX-WIT-XXX.BASENETAMOUNT				
BULK AMOUNT	.BULKAMOUNT				XX-WIT-XXX	XX-WIT-XXX.BULKAMOUNT				
HIGH WEIGHT	.HIGHWEIGHT	X			XX-WIT-XXX	XX-WIT-XXX.HIGHWEIGHT	X			
LOW WEIGHT	.LOWWEIGHT	X			XX-WIT-XXX	XX-WIT-XXX.LOWWEIGHT	X			
SOFTWARE FAILURE	.FAILSOFT				XX-WIT-XXX	XX-WIT-XXX.FAILSOFT	X			
MEASUREMENT FAILURE	.FAILMEAS	X			XX-WIT-XXX	XX-WIT-XXX.FAILMEAS	X			
HARDWARE FAILURE	.FAILHARD				XX-WIT-XXX	XX-WIT-XXX.FAILHARD	X			
COMMUNICATION FAILURE	.FAILCOMM				XX-WIT-XXX	XX-WIT-XXX.FAILCOMM	X			

ULTRASONIC LEVEL										
PROTOCOL: PROFIBUS DP or Profinet										
MONITORING										
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LEVEL 1	.UL_L1_LEVEL	X	X	X	XX-WIT-XXX	XX-WIT-XXX.UL_L1_LEVEL				X
Status word L1	.UL_L1_STS		X		XX-WIT-XXX	XX-WIT-XXX.UL_L1_STS				X
Echo Strength L1	.UL_L1_Ech_Stgh	X	X	X	XX-WIT-XXX	XX-WIT-XXX.UL_L1_Ech_Stgh				
LEVEL 2	.UL_L2_LEVEL		X		XX-WIT-XXX	XX-WIT-XXX.UL_L2_LEVEL				
Status word L2	.UL_L2_STS		X		XX-WIT-XXX	XX-WIT-XXX.UL_L2_STS				
Echo Strength L2	.UL_L2_Ech_Stgh		X		XX-WIT-XXX	XX-WIT-XXX.UL_L2_Ech_Stgh				
Digital Input STS	.UL_DI_STS		X		XX-WIT-XXX	XX-WIT-XXX.UL_DI_STS				
Relay Output STS	.UL_REL_STS		X		XX-WIT-XXX	XX-WIT-XXX.UL_REL_STS				

RADAR LEVEL										
PROTOCOL: PROFIBUS DP or Profinet										
MONITORING										
DESCRIPTION	TAG SUFFIX	HISTORIZE	INDICATE	TREND	Instrument Tag	Scada Tag	ALARM MSG	Warning MSG	Information MSG	PI Tag
LEVEL	.LEVEL	X	X	X	XX-WIT-XXX	XX-WIT-XXX.LEVEL	X			X
LEVEL UNIT TXT	.LVLUNITTXT		X		XX-WIT-XXX	XX-WIT-XXX.LVLUNITTXT				
EMPTY CALIBRATION	.CALEMPTY		X		XX-WIT-XXX	XX-WIT-XXX.CALEMPTY				
FULL CALIBRATION	.CALFULL		X		XX-WIT-XXX	XX-WIT-XXX.CALFULL				
CHECK DISTANCE	.CHECKDIST				XX-WIT-XXX	XX-WIT-XXX.CHECKDIST				
RANGE OF MAPPING	.RANGEMAP		X		XX-WIT-XXX	XX-WIT-XXX.RANGEMAP				
START MAPPING	.STARTMAP				XX-WIT-XXX	XX-WIT-XXX.STARTMAP				
ECHO QUALITY	.ECHOQUAL		X		XX-WIT-XXX	XX-WIT-XXX.ECHOQUAL	X			
BLOCKING DISTANCE	.BLOCKDIST		X		XX-WIT-XXX	XX-WIT-XXX.BLOCKDIST				
DISTANCE UNIT	.UNITDIST		X		XX-WIT-XXX	XX-WIT-XXX.UNITDIST				
SOFTWARE FAILURE	.FAILSOFT				XX-WIT-XXX	XX-WIT-XXX.FAILSOFT	X			
MEASUREMENT FAILURE	.FAILMEAS	X			XX-WIT-XXX	XX-WIT-XXX.FAILMEAS	X			
HARDWARE FAILURE	.FAILHARD				XX-WIT-XXX	XX-WIT-XXX.FAILHARD	X			
COMMUNICATION FAILURE	.FAILCOMM				XX-WIT-XXX	XX-WIT-XXX.FAILCOMM	X			

LINE/PIPE DESIGNATION



HEAT TRACING AND INSULATION I.D.

ET(*)	- ELECTRICALLY TRACED AND INSULATED
ETT(*)	- ELECTRICALLY TRACED WITH HEAT TRANSFER CEMENT AND INSULATION
(*)	- (lh), HEAT CONSERVATION
(*)	- (W), WINTERIZATION
TB	- HEAT TRACED VALVE BODY, INSULATED
TBB	- HEAT TRACED VALVE BODY AND BONNET, INSULATED

GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK (*) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK (**) ARE TO BE UNDER DIVISION XX, (NAME OF DIVISON).
3. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.
4. ALL COMPONENTS SHOWN INSIDE PACKAGE SYSTEM BOUNDARY ARE TO BE PROVIDED AS PART OF THE PACKAGE SYSTEM.

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Final Comments:

1. This standard does not attempt to define every symbol which could be used in a P&ID drawing set but attempts to provide a guideline for symbols which are used in the design. It is recognized that many modern CAD programs have a symbol package available based on ISA standards and these symbol libraries are acceptable as long as the standards set forth in this document are complied with. This may require the Engineer to create additional line types in the CAD program to comply with this standard.
2. All area numbers must be labeled on a site drawing, so the symbols are quickly located on the site plan. The area numbers shall be the first part of the P&ID Tag Number.
3. All additional abbreviations in the drawing set must be clearly defined in the abbreviation table. The abbreviation table should be located in an easy to find location near the beginning of the drawing set.
4. Any non-standard abbreviations must be properly referenced on each drawing where the non-standard abbreviation occurs. The non-standard abbreviation must be referenced to a specific section in the specifications or clearly defined on the drawing where it occurs.
5. When I/O located in one area is to be routed to another area and a break in the connection occurs, an indication on the P&ID must take place. The connection must be clearly referenced in both places on both drawings where the break occurs, and the connection continues. The reference must include: 1) the drawing number where the connection continues and the destination of the continuation and 2) on the drawing where the continuation is located, the location of the break (drawing number) and the starting point of the connection which is broken.
6. Provide a one-line diagram for communications. Diagram should indicate routing of fiber from structure to structure as well as copper cable routing from structure to structure. Include all handholes, manholes, junction boxes, pull boxes, etc. One-line diagram shall be organized so as to indicate when routing travels from building/structure to a different building/structure. Symbols shall represent proper location of devices and equipment. For example, indicate a PLC with a box located inside the panel and the panel inside the building. Indicate proper cabling or connections and changes in the cabling such as transitioning from fiber to copper.
7. Provide a site plan indicating area of work and routing of communication cables and fiber.
8. All boxes shall be properly labeled on the P&ID. All mechanical equipment, control panels, and electrical gear/devices which are inside or on the side of a buildings/structures and are being referenced or have connections going to them, shall be located inside the box or on the side as required with the proper building/structure and device label.
9. All I/O indicated on P&ID shall be shown connected to its controlling PLC. Connections shall be both from a physical or cabling perspective and from a controlling perspective.
10. Tables are provided for Designer's use; however, tables are not intended to be supplied in a final format. Designer shall modify as required to meet the actual design parameters.