

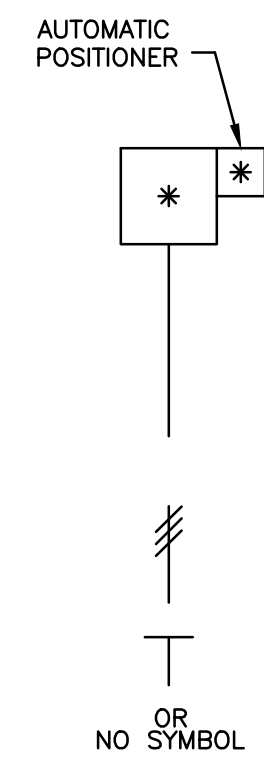
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GENERAL INSTRUMENT OR FUNCTION SYMBOLS		PROCESS DEVICE SYMBOLS		PROCESS DEVICE SYMBOLS (CONTINUED)		FUNCTION SYMBOLS & ABBREVIATIONS		
	DISCRETE INSTRUMENT – FIELD MOUNTED		REDUCER OR ENLARGER		VALVE: GLOBE OR OTHER IN-LINE TYPE, UNLESS OTHERWISE INDICATED.	$\Sigma$	SUMMING	HAND SWITCH ABBREVIATIONS:
	DISCRETE INSTRUMENT – PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR ①		PRIMARY ELEMENT VENTURI TUBE		BUTTERFLY VALVE	$\Sigma/n$	AVERAGING	A AUTOMATIC
	DISCRETE INSTRUMENT – AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR ①		PRIMARY ELEMENT MAGNETIC FLOWMETER		CHECK VALVE WITH FLOW DIRECTION AS INDICATED	$\Delta$	SUBTRACTING	C COMPUTER OR CLOSE
	INSTRUMENTS SHARING COMMON HOUSING		PRIMARY ELEMENT ULTRASONIC DOPPLER FLOWMETER		PLUG VALVE	$\sqrt{\quad}$	EXACT SQUARE ROOT	H HAND
	INSTRUMENT FURNISHED WITH SPECIFIC FIELD COMPONENT (E.G. PUMP, NLOWER, VALVE, CONVEYOR, ETC.)		PRIMARY ELEMENT PARSCHALL FLUME		BALL VALVE	+	DIVIDE	L LOCAL
	EXISTING EQUIPMENT		PRIMARY ELEMENT ORIFICE PLATE		PRESSURE REGULATING VALVE – SELF CONTAINED	x	MULTIPLY	M MODULATE
	FUTURE EQUIPMENT		PRIMARY ELEMENT WEIR FLOWMETER		FLOW CONTROL GATE OR GATE VALVE	S	INTEGRATE	O OFF OR OPEN
	CONTROL INTERLOCK		PRIMARY ELEMENT TURBINE OR PROPELLER TYPE METER		CENTRIFUGAL BLOWER	+	BIAS POSITIVE	R REMOTE
	CONTROL SYSTEM I/O INTERFACE – ANALOG SIGNAL. TRIANGLE DENOTES WHETHER INPUT OR OUTPUT.		PRIMARY ELEMENT PITOT TUBE		CENTRIFUGAL PUMP	-	BIAS NEGATIVE	S START OR STOP
	CONTROL SYSTEM I/O INTERFACE – DISCRETE SIGNAL. TRIANGLE DENOTES WHETHER INPUT OR OUTPUT.		PRIMARY ELEMENT ROTAMETER		DIAPHRAGM PUMP & MOTOR	$\sqrt{x}$	NONLINEAR OR UNSPECIFIED FUNCTION	OTHER ABBREVIATIONS:
	DIAPHRAGM SEAL		PRIMARY ELEMENT ULTRASONIC TRANSIT TIME METER		DISC FLOW OR PROGRESSIVE CAVITY PUMP	>	HIGH SELECT	AI ANALOG INPUT
			PRIMARY ELEMENT ULTRASONIC DOPPLER METER		VERTICAL PUMP	<	LOW SELECT	AO ANALOG OUTPUT
			PRIMARY ELEMENT ULTRASONIC FLOW OR LEVEL METER		MOTOR – MAY BE ELECTRIC, HYDRAULIC, OR PNEUMATIC. ARROW DENOTES VARIABLE SPEED.	}	HIGH LIMIT	AS AIR SUPPLY
			FLOAT SWITCH		SAMPLE POINT	↑	LOW LIMIT	COND CONDUCTIVITY
			DRAIN			**	SIGNAL TRANSDUCER OR CONVERTER (INPUT/OUTPUT) * DEFINED AS FOLLOWS:	CR CHLORINE RESIDUAL
			CHEMICAL INJECTION POINT			E	VOLTAGE	CTU CENTRAL TELEMETRY UNIT
			MIXER			H	HYDRAULIC	DCU DISTRIBUTED CONTROL UNIT
						I	CURRENT	DI DIGITAL OR DISCRETE INPUT
						PD	PULSE DURATION	DO DISSOLVED OXYGEN OR DIGITAL OUTPUT
						O	ELECTROMAGNETIC, SONIC	ES ELECTRIC SUPPLY
						P	PNEUMATIC	FC FAIL CLOSED
						PD	PULSE DURATION	FLP FAIL LAST POSITION
						R	RESISTANCE (ELECTRIC)	FO FAIL OPEN
								MC MOTOR CONTROLLER
								NC NORMALLY CLOSED
								pH HYDROGEN ION CONCENTRATION
								PLC PROGRAMMABLE LOGIC CONTROLLER
								POLM POLYMER
								RTU REMOTE TERMINAL UNIT
								TURB TURBIDITY
								VIB VIBRATION
								VSD VARIABLE SPEED DRIVE

### GENERAL NOTES

- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS & ABBREVIATIONS MAY NOT APPLY TO THIS SPECIFIC PROJECT.
- THIS LEGEND APPLIES TO INSTRUMENTATION DIAGRAMS ONLY, & ITS SYMBOLS MAY NOT BE APPLICABLE TO NON-INSTRUMENTATION DRAWINGS.
- THIS LEGEND SHEET & THE INSTRUMENTATION DIAGRAMS & I-DRAWINGS ARE GENERALLY BASED ON THE INSTRUMENT SOCIETY OF AMERICA'S STANDARDS FOR PRACTICES IN INSTRUMENTATION. SOME MODIFICATIONS, ADDITIONS, & ALTERATIONS MAY HAVE BEEN MADE TO ACCOMMODATE INDIVIDUAL PROJECT REQUIREMENTS.
- SOME PROCESS ITEMS (SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, ETC.) WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION FUNCTIONS ARE NOT SHOWN ON THE INSTRUMENTATION SHEETS.
- SEE ELECTRICAL SHEETS & SPECIFICATIONS FOR ADDITIONAL CONTROL & INTERLOCK REQUIREMENTS FOR EQUIPMENT NOT SHOWN OR NOT PROVIDED BY THE INSTRUMENTATION SUPPLIER.
- SLANTED TEXT DENOTES EXISTING EQUIPMENT OR STRUCTURES. NON-SLANTED TEXT DENOTES NEW EQUIPMENT, STRUCTURES, & WORK. SLANTED TEXT (NOT SHADED) DENOTES FUTURE EQUIPMENT STRUCTURES & WORK.

### VALVE ACTUATOR SYMBOLS



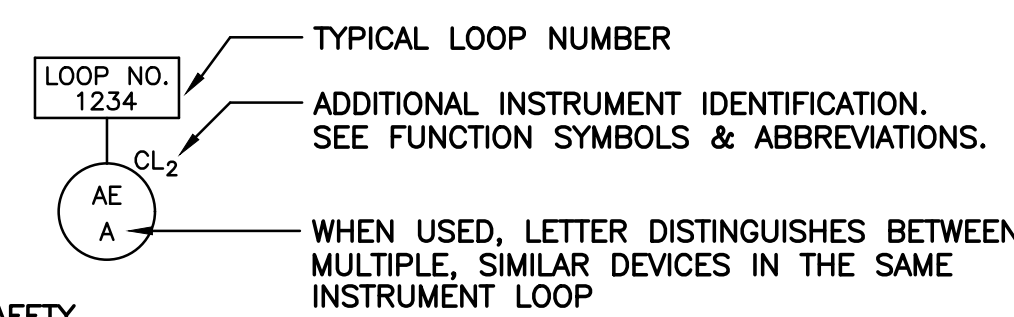
**VALVE OR GATE ACTUATOR WITH DEFINED AS FOLLOWS:**

P: AIR CYLINDER  
 S: SOLENOID  
 P/O: AIR/OIL CYLINDER  
 E: ELECTRIC MOTOR  
 H: HYDRAULIC CYLINDER  
 EH: ELECTROHYDRAULIC  
 Z: MISCELLANEOUS

FOR PRESSURE RELIEF OR SAFETY VALVES ONLY

MANUALLY (HAND) OPERATED

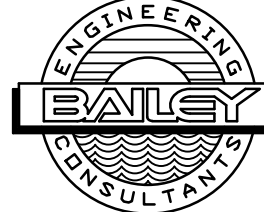
### TAG NUMBER & DESIGNATION EXAMPLE



### INSTRUMENTATION IDENTIFICATION LETTERS

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		EMERGENCY	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE		CLEANER	CONTROL	
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)	GLASS		
G	GAUGING (DIMENSIONAL)				
H	HAND (MANUALLY INITIATED)				HIGH OR OPEN
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW OR CLOSED
M	USER'S CHOICE	MOMENTARY			MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)		
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE			
R	RUN		RECORD		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VISCOSITY, VIBRATION			VALVE, DAMPER, OR LOUVER	
W	WEIGHT OR TORQUE		WELL		
X	FAILURE	X AXIS			
Y	EVENT, STATE, OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVE, ACTUATE, OR UNCLASSIFIED CONTROL ELEMENT	

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	DATE 4/24/20		STEPHEN E. BAILEY, P.E.		
	SCALE: AS NOTED		42461		
	DESIGNED BY SEB				
	DRAWN BY SJL				
NO.	REVISIONS	DATE	BY		

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