

LINES	VARIABLES	CONTROL VALVE BODIES	SELF-ACTUATED DEVICES	MISCELLANEOUS	
<p>CONNECTION TO PROCESS, MECHANICAL LINK OR INSTRUMENT INPUT</p> <p>PNEUMATIC SIGNAL</p> <p>ELECTRIC SIGNAL</p> <p>CAPILLARY TUBING (FILLED SYSTEM)</p> <p>HYDRAULIC SIGNAL</p> <p>RADIATION OR SONIC SIGNAL (WITHOUT WIRING OR TUBING)</p> <p>A/S INSTRUMENT AIR SUPPLY</p> <p>W/S WATER SUPPLY</p> <p>G/S GAS SUPPLY</p> <p>N/S NITROGEN SUPPLY</p> <p>PURGE</p> <p>NOTE: THE MEANS OF REGULATING PURGE MAY BE SHOWN IN PLACE OF PURGE SYMBOL</p>	<p><b>TYPICAL CONNECTION-ANY VARIABLE</b></p> <p>DIRECT CONNECTION PROCESS BLOCK VALVE SYMBOL OPTIONAL</p> <p>ELECTRICAL CONNECTION</p> <p>FILLED SYSTEM, DIRECT CONNECTION</p> <p>IN LINE DEVICE</p> <p>RADIATION OR SONIC SENSING</p> <p>DIAPHRAGM SEAL CONNECTION</p> <p>FLOW</p> <p>ORIFICE PLATE OR RESTRICTION ORIFICE</p> <p>ORIFICE PLATE IN QUICK CHANGE FITTING</p> <p>VENTURI TUBE OR FLOW NOZZLE</p> <p>PITOT OR PITOT VENTURI TUBE</p> <p>FLUME</p> <p>WEIR</p> <p>TURBINE-OR PROPELLER-TYPE PRIMARY ELEMENT</p> <p>ROTAMETER</p> <p>IN-LINE INSTR. SUCH AS: MAGNETIC FLOWMETER, DISPLACEMENT METER, MASS FLOWMETER, FLOW SIGHT GLASS</p> <p>FLOW STRAIGHTENING VANES</p>	<p><b>LEVEL</b></p> <p>GAGE GLASS, FLOAT OR DISPLACEMENT-TYPE LEVEL INSTRUMENT</p> <p>DIFFERENTIAL-PRESSURE TYPE LEVEL INSTRUMENT</p> <p>(IF REQ'D) FLANGE-MOUNTED DIFFERENTIAL-PRESSURE TYPE LEVEL TRANSMITTER</p> <p>INTERNAL BALL-FLOAT-TYPE LEVEL INSTRUMENT</p> <p>GAGE-BOARD-TYPE LEVEL INSTRUMENT</p> <p><b>TEMPERATURE</b></p> <p>DUAL OR DUPLEX THERMOCOUPLE IN ONE WELL</p> <p>SINGLE THERMOCOUPLE NORMALLY RECORDED, OPTIONALLY INDICATED</p> <p>SINGLE THERMOCOUPLE, PARALLEL WIRED</p> <p>RTD RESISTANCE TEMP. DETECT.</p>	<p>GLOBE, GATE OR OTHER IN-LINE TYPE NOT OTHERWISE IDENTIFIED</p> <p>FO INDICATES FAIL OPEN</p> <p>FC INDICATES FAIL CLOSED</p> <p>FL INDICATES FAIL LOCKED</p> <p>FI INDICATES FAIL INDETERMINATE</p> <p>ANGLE</p> <p>BUTTERFLY, DAMPER OR LOUVER</p> <p>BALL</p> <p>THREE-WAY F = FAIL POSITION</p> <p>FOUR-WAY</p> <p>DIAPHRAGM (SAUNDERS-TYPE)</p> <p>PLUG</p> <p>PINCH VALVE</p> <p>UNCLASSIFIED (TYPE OF BODY IS WRITTEN IN OR ADJACENT TO SYMBOL)</p> <p>NOTE: LINE DRAWN THROUGH VALVE BODY OPTIONAL</p> <p><b>ACTUATORS</b></p> <p>(IF REQ'D) PNEUMATIC ACTUATOR</p> <p>AO INDICATES AIR OPENS</p> <p>AC INDICATES AIR CLOSURES</p> <p>DIAPHRAGM, PRESSURE-BALANCED</p> <p>ROTARY MOTOR (SHOWN TYPICALLY WITH ELECTRIC SIGNAL)</p> <p>CYLINDER, SINGLE-ACTING; ALSO DOUBLE-ACTING CYLINDER THAT IS ASSEMBLED WITH PILOT, SO THAT ACTUATOR ASSEMBLY IS ACTUATED BY ONE CONTROLLED INPUT</p> <p>CYLINDER, DOUBLE-ACTING, WITH ACTUATING PILOT VALVE</p> <p>CYLINDER, DOUBLE-ACTING ASSEMBLED WITHOUT PILOT</p> <p>HAND ACTUATOR (MOUNTED AT TOP SIDE, OR BOTTOM OF ACTUATED DEVICE AS APPLICABLE)</p> <p>ELECTRO-HYDRAULIC</p> <p>UNCLASSIFIED (TYPE OF ACTUATOR TO BE WRITTEN ADJACENT TO THE SYMBOL)</p> <p>SOLENOID RESET (OPTIONAL)</p> <p>CONTROL VALVE SYMBOL, FOR ANY APPLICATION</p> <p>ELECTRO-PNEUMATIC</p> <p>(IF SHOWN) POSITION MODULATOR ON PNEUMATIC ACTUATOR</p>	<p><b>FLOW</b></p> <p>FLOW REGULATORS, SELF-CONTAINED</p> <p>LEVEL</p> <p>LEVEL REGULATOR WITH MECHANICAL LINKAGE</p> <p>PRESSURE</p> <p>PRESSURE-REDUCING REGULATOR, SELF-CONTAINED</p> <p>PRESSURE-REDUCING REGULATOR, WITH EXTERNAL PRESSURE TAP</p> <p>DIFFERENTIAL-PRESSURE-REDUCING REGULATOR WITH INTERNAL AND EXTERNAL PRESSURE TAPS</p> <p>BACKPRESSURE REGULATOR, SELF-CONTAINED</p> <p>BACKPRESSURE REGULATOR WITH EXTERNAL PRESSURE TAP</p> <p>PRESSURE RELIEF OR SAFETY VALVE, ANGLE PATTERN, SPRING-OR WEIGHT-LOADED, OR WITH INTEGRAL PILOT</p> <p>PRESSURE RELIEF OR SAFETY VALVE, STRAIGHT-THROUGH PATTERN, SPRING-OR WEIGHT-LOADED, OR WITH INTEGRAL PILOT</p> <p>VACUUM RELIEF, ANGLE PATTERN, SPRING-OR WEIGHT-LOADED, OR WITH INTEGRAL PILOT</p> <p>PRESSURE RELIEF OR SAFETY VALVE, ANGLE PATTERN, TRIPPED BY INTEGRAL SOLENOID</p> <p>RUPTURE DISK OR SAFETY HEAD FOR PRESSURE RELIEF</p> <p>RUPTURE DISK OR SAFETY HEAD FOR VACUUM RELIEF</p> <p><b>TEMPERATURE</b></p> <p>TEMPERATURE REGULATOR, FILLED SYSTEM TYPE</p>	<p><b>RELAY</b></p> <p>I:I RELAY (VOLUME BOOSTER)</p> <p>HIGH MEASURED VARIABLE SELECTOR IF HIGH SIGNAL SELECTOR ADD (SIGNAL)</p> <p>SQUARE ROOT EXTRACTOR</p> <p>FOR ADDITIONAL EXAMPLES SEE ISA55-1</p> <p>INTERLOCK</p> <p>PANEL MOUNTED PATCHBOARD OR MATRIX CONNECTION</p> <p>ALARM</p> <p>PILOT LIGHTS</p> <p>R - RED G - GREEN A - AMBER</p> <p>INPUT SIGNAL FROM PROGRAMMER</p> <p>NOTES:</p> <ol style="list-style-type: none"> <li>THIS DRAWING IS BASED ON THE INSTRUMENT SOCIETY OF AMERICA STANDARD No. 55.1 - 1967</li> <li>TEXT ENTRIES AROUND INSTRUMENT BALLOON</li> </ol> <p><b>NOTE:</b></p> <p>THE SYMBOLS SHOWN HERE ARE FOR USE WITH P&amp;ID'S M-100 THROUGH M-149 &amp; M-180 THROUGH M-183 ONLY. REFER TO M-179 FOR SYMBOLS AND ABBREVIATIONS USED ON THE HV/AC P&amp;ID'S M-150 THROUGH M-178.</p> <p>J1- INSTRUMENT IDENTIFIER (PREFIX) J2- INSTRUMENT NUMBER INCLUDING (SUFFIX) J3- NUMBER OF REPRESENTATION FOR BALLOONS SHOWN MORE THAN ONCE ON P&amp;ID'S. J4- LOCATION J5- FUNCTION (E.G. ESD) J6- OTHER P&amp;ID LOCATIONS WHERE INSTRUMENT BALLOON IS SHOWN (SEE J3 ABOVE)</p>
<p><b>INSTRUMENTS</b></p> <p>(1/2" DIA.) LOCAL INSTRUMENT INCLUDING TRANSMITTER FOR SINGLE MEASURED VARIABLE</p> <p>LOCAL INSTRUMENT FOR TWO MEASURED VARIABLES OR MORE THAN ONE FUNCTION</p> <p>PANEL MOUNTED INSTRUMENT FOR SINGLE MEASURED VARIABLE</p> <p>PANEL MOUNTED INSTRUMENT FOR TWO MEASURED VARIABLES OR MORE THAN ONE FUNCTION</p> <p>SEE NOTE 2 FOR STANDARD LOCATION OF TEXT ENTRIES AROUND INSTRUMENT BALLOON</p>					
<p><b>DIGITAL DATA SYSTEM-COMPUTER</b></p> <p>(1/16" x 3/16") MEASURED VARIABLE (TEMP., PRESS., ETC.)</p> <p>COMPUTER POINT IDENTIFICATION (SEE 1/0 LIST-DWG. NO. 7884-M-482)</p> <p>FUNCTIONAL IDENTIFICATION</p> <p>A-ANALOG C-DIGITAL OR CONTACT</p> <p>CONTAINMENT ISOLATION MONITORING SYSTEM (PANEL 1C580)</p>					
<p><b>DATA ACQUISITION SYSTEM-SPDA</b></p> <p>MEASURED VARIABLE (SEE CHART DWG. NO. 7884-M-102)</p> <p>SPDS POINT IDENTIFICATION</p> <p>A-ANALOG C-DIGITAL OR CONTACT</p> <p>REF-MASTER SIGNAL LIST</p>					

D-003

12	1 94	REV. PER DDC-2410	LG	TAK	JDK	LBS
11	3/4/93	REV. PER DCP-1415	MS	SJ	BPM	TH
10	1/1/96	REVISED PER DDC1796				
9	1/1/96	REV. PER DCP-1201	JW			
NO.	DATE	REVISION	OFFTR.	CHNGD	ENGR.	VER.

**BECHTEL**  
SAN FRANCISCO

**DUANE ARNOLD ENERGY CENTER-UNIT No 1**  
IOWA ELECTRIC LIGHT AND POWER COMPANY  
CEDAR RAPIDS, IOWA

P.&I.D.  
INSTRUMENT SYMBOLS

DRAWING No. BECH-M101

REV. 12