

**PROCESS FLOW DIAGRAMS AND P&ID SYMBOLS (GENERAL INSTRUMENT OR FUNCTION SYMBOLS)**

REVISION 1, DATE 9-16-2004

LINE TYPES		
SYMBOL	LINE TYPE	DESCRIPTION
	CONTINUOUS	PRIMARY PROCESS FLOW LINE
	CONTINUOUS	SECONDARY PROCESS FLOW LINE
	CONTINUOUS	INSTRUMENT SUPPLY OR CONNECTION TO PROCESS
	CONTINUOUS	UNDEFINED SIGNAL
	CONTINUOUS	PNEUMATIC SIGNAL *
	HIDDENX2	ELECTRIC SIGNAL
	CONTINUOUS	HYDRAULIC SIGNAL
	CONTINUOUS	CAPILLARY TUBE
	CONTINUOUS	ELECTROMAGNETIC OR SONIC SIGNAL ** (GUIDED)
	CONTINUOUS	ELECTROMAGNETIC OR SONIC SIGNAL ** (NOT GUIDED)
	CONTINUOUS	INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)
	CONTINUOUS	MECHANICAL LINK
OPTIONAL BINARY (ON-OFF) SYMBOLS		
	CONTINUOUS	PNEUMATIC BINARY SIGNAL
	DASHED2	ELECTRIC BINARY SIGNAL
	CONTINUOUS	ELECTRICAL HEAT TRACING
	CONTINUOUS/DASHED2	STEAM HEAT TRACING
	DASHED2	BURIED LINES
	PHANTOM	EXISTING
	CENTER	FP - FLOOR PENETRATION RP - ROOF PENETRATION WP - WALL PENETRATION SB - SYSTEM BREAK

NOTES:  
\*OR\* MEANS USER CHOICE. CONSISTENCY IS RECOMMENDED.

\* THE PNEUMATIC SIGNAL SYMBOL APPLIES TO A SIGNAL USING ANY GAS AS THE SIGNAL MEDIUM. IF GAS OTHER THAN AIR IS USED, THE GAS MAY BE IDENTIFIED BY A NOTE ON THE SIGNAL SYMBOL OR OTHERWISE.

\*\* ELECTROMECHANICAL PHENOMENA INCLUDE HEAT, RADIO WAVES, NUCLEAR RADIATION, AND LIGHT.

SYMBOL	DESCRIPTION
	P=PURGE OR FLUSHING DEVICE R=RESET FOR LATCH-TYPE ACTUATOR I=UNDEFINED INTERLOCK LOGIC
	S=SOLENOID D=DIGITAL T=TRAP P=PILOT M=MAGNETIC FLOWMETER SP=SET POINT
	ROOT EXTRACTION
	BIAS
	MULTIPLY
	HIGH SELECTING
	LOW SELECTING
	HIGH LIMITING
	LOW LIMITING
	PROPORTIONAL
	REVERSE PROPORTIONAL
	SUMMING
	DIVIDING
	EQUIPMENT TAG
	PIPE OR WIRE IS CONTINUED ON DRAWING X (INCLUDING SHEET NUMBER), GRID COORDINATE (Y-#); FLOW IS TO THAT DRAWING.
	PIPE OR WIRE IS CONTINUED ON DRAWING X (INCLUDING SHEET NUMBER), GRID COORDINATE (Y-#); FLOW IS FROM THAT DRAWING.
	PIPE OR WIRE IS CONTINUED ON DRAWING X (INCLUDING SHEET NUMBER), GRID COORDINATE (Y-#); FLOW IS IN BOTH DIRECTIONS

ACRONYMS	
EQUIPMENT	
AHU	- AIR HANDLING UNIT
ASV	- AIR SWITCH VALVE
CA	- AIR COMPRESSOR
CAE	- COOLER, AIR EVAPORATIVE
D	- DAMPER
DAD	- DESICCANT AIR DRYER
DAMD	- DUCT AIR MONITOR DEVICE
ES	- EXHAUST STACK
FAB	- FILTER AIR BOX
FANE	- FAN EVALUATOR
FAR	- FILTER AIR REPLACEABLE
FC	- FAN CIRCULATING
FD	- FIRE DAMPER
FE	- FAN EXHAUST
FRA	- FAN, RETURN AIR
FRL	- FILTER AIR ROLL
FS	- FAN SUPPLY
HEPA	- HIGH EFFICIENCY PARTICULATE AIR FILTER
HX	- HEAT EXCHANGER
MT	- MOISTURE TRAP
OIM	- OPERATOR INTERFACE MODULE
SST	- SYSTEM STATIC TOTALIZER
TCA	- TANK COMPRESSED AIR
TK	- TANK
T	- TRAP
V	- VALVE
VFD	- VARIABLE FREQUENCY DRIVE/MOTOR CONTROLLER
YS	- PLC CONTROL OUTPUT
MINOR EQUIPMENT	
OPEN DRAIN ANNOTATIONS	
RD	- RADIOACTIVE DRAIN TO DRAIN HEADER
ND	- NONRADIOACTIVE DRAIN
AW	- ACID WASTE
NW	- NORMAL WASTE
OW	- OIL WASTE
SW	- SANITARY WASTE
LINE VALVE STATUS SYMBOLS	
TYPICAL VALVE ANNOTATIONS	
FO	- FAIL OPEN
FC	- FAIL CLOSED
FL	- FAIL LOCKED (POSITION DOES NOT CHANGE)
FI	- FAIL INDETERMINATE
FAI	- FAIL AS IS
NO	- NORMALLY OPEN
NC	- NORMALLY CLOSED
LO	- LOCKED OPEN
LC	- LOCKED CLOSED
MISCELLANEOUS ACRONYMS	
WP	- WALL PENETRATION
FP	- FLOOR PENETRATION
RP	- ROOF PENETRATION
AO	- ANALOG OUTPUT
AI	- ANALOG INPUT
DI	- DIGITAL INPUT
RO	- RELAY OUTPUT

**GENERAL NOTES**

- M-0001 IS A STANDARD PIPING AND INSTRUMENTATION DIAGRAM LEGEND SHEET.
- FOR DRAWING TITLE BLOCK CONTENTS REFER TO THE DRAFTING MANUAL SECTION 202.10.
- THE SHEET NUMBER IN THE TITLE BLOCK IS A REFERENCE NUMBER FOR THIS MANUAL.

INSTRUMENT/FUNCTION SYMBOLS				
	PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR	AUXILIARY LOCATION NORMALLY INACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS				
SHARED DISPLAY, SHARED CONTROL				
COMPUTER FUNCTION				
PROGRAMMABLE LOGIC CONTROL				

**INSTRUMENTATION IDENTIFICATION TABLE**

J-1	COMPONENT FUNCTION NUMBER
J-2	COMPONENT SEQUENCE NUMBER
J-2A	COMPONENT SEQUENCE # CONT'D
J-3	VENDOR DESIGNATION
J-4	PANEL NUMBER
J-5	APPLICABLE NOTES
J-6	SYSTEM ACRONYM
J-7	ASME TEST SYMBOL FOR TEST ONLY OR TEST PLUS NORMAL USE
J-8	SET-POINT(S)
J-9	FUNCTION (SEE INSTRUMENT/FUNCTION SYMBOLS)

NOTE:  
INSTRUMENTATION FUNCTION IDENTIFIERS (J-1) AND FUNCTION SYMBOLS PER ANSI/ISA S5.1.

SYMBOL	DESCRIPTION
	FLOW INDICATOR TO BE USED IN CONJUNCTION WITH P016
	INSTRUMENTS SHARING COMMON HOUSING
	PANEL MOUNTED PATCHBOARD POINT 12

NO	DATE	CLASS REV	ADD	DESCRIPTION	DRN	DSGN	CHKD	SUB	APP
<p><b>FACILITY &amp; WASTE OPERATIONS DESIGN ENGINEERING CONSTRUCTION SERVICES</b></p>									
<p><b>PROCESS FLOW DIAGRAMS AND P&amp;ID SYMBOLS</b></p>					<p>DRAWN: DRAFTER</p> <p>DESIGN: DESIGN(S)</p> <p>CHECKED: CHECKER</p>				
<p>PROCESS FLOW AND P&amp;ID AND INSTRUMENTATION DIAGRAM LEGEND</p>					<p>DATE: MM-DD-YY</p> <p>MM-DD-YY</p>				
BLDG XX					TA-XX				
SUBMITTED					APPROVED FOR RELEASE				
PROJECT ENGINEER					PROJECT TEAM LEADER				
SHEET					M-0001				
<p>NATIONAL LABORATORY</p>					<p>PO Box 1663 Los Alamos, New Mexico 87545</p> <p>CLASSIFICATION UNCL</p>				
PROJECT ID					DRAWING NO				
REVIEWER LARRY BAYS					DATE				
ST6999					REV 1				