SYMBOLS

- PRIMARY FLOW LINE
- SECONDARY FLOW LINE
- TRANSMISSION LINE (PNEUMATIC)
- SUPPLY LINE (PNEUMATIC)
- CAPILLARY LINE
- ELECTRICAL SIGNAL
- HYDRAULIC SIGNAL
- ELECTRONIC OR SONIC SIGNAL (WITHOUT TUBING OR WIRING)
- HATCHLINE
- EXISTING EQUIPMENT
- E — ELECTRIC HEAT TRACE
- S — STEAM HEAT TRACE
- HYDRAULIC SUPPLY LINE
- T — CONTINUOUS DRAINER
- FILTER REGULATOR
- 2" — INSULATION
- LINE SIZE CHANGE
- OPEN DRAIN SYSTEM
- SPECTACLE BLIND
- "Y" STRAINER
- TEMPORARY STRAINER
- T — TRAPS - OTHER THAN BALL FLOAT CONTINUOUS DRAINERS
- ANGLE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- WAFER CHECK VALVE
- CHOKE VALVE (FIXED)
- CHOKE VALVE (ADJUSTABLE)
- CONTROL VALVE (DIAPHRAGM OPERATED)
- I.A.S. — CONTROL VALVE WITH VALVE POSITIONER
- M — MOTOR OPERATED VALVE
- FLANGED VALVE
- GATE VALVE
- WELD END VALVE
- GLOBE VALVE
- HAND CONTROL VALVE
- CONTROL VALVE (PNEUMATIC OPERATED)
- NEEDLE VALVE
- PLUG VALVE
- THREE-WAY CONTROL VALVE (DIAPHRAGM OPERATED)
- RELIEF VALVE
- SOLENOID VALVE TWO WAY
- SOLENOID VALVE THREE WAY
- THREE WAY VALVE
- BACKPRESSURE REGULATOR WITH EXTERNAL PRESSURE TAP
- LATCH-TYPE SOLENOID ACTUATOR FOR MANUAL RESET
- PRESSURE-REDUCING REGULATOR SELF-CONTAINED
- BACKPRESSURE REGULATOR, SELF CONTAINED
- PRESSURE REDUCING REGULATOR WITH EXTERNAL PRESSURE TAP
- FLOW ELEMENT VENTURI
- FLOW ELEMENT (TURBINE TYPE)
- FLOW ELEMENT (MAGNETIC TYPE)
- FLOW STRAIGHTENING VANES
- RUPTURE DISK
- FLOW ELEMENT (ORIFICE TYPE)
- TEMPERATURE ELEMENT W/ WELL
- POSITIVE DISPLACEMENT METER
- FLAME ARRESTER
- DETONATION ARRESTER
- INDICATING LIGHT
- CHEMICAL SEAL
- P — PURGE DEVICE
- FLOW INDICATOR
- S — LOCAL INTERLOCK SHUTDOWN
- V — LOCAL INTERLOCK WASTE STREAM
- LOCAL INTERLOCK

RELAY FUNCTION DESIGNATORS

A/D	ANALOG TO DIGITAL TRANSDUCER
D/A	DIGITAL TO ANALOG TRANSDUCER
E/I	VOLTAGE TO CURRENT TRANSDUCER
I/P	CURRENT TO PNEUMATIC TRANSDUCER
P/I	PNEUMATIC TO CURRENT TRANSDUCER
Σ	ADD OR TOTALIZE SIGNAL SUMMATION
√	SQUARE ROOT EXTRACTION
Δ	DIFF. SUBSTRACT
>	HIGH SELECT
<	LOW SELECT
×	MULTIPLIER

ABBREVIATIONS

AAL	ANALYSIS ALARM LOW
AAH	ANALYSIS ALARM HIGH
AY	ANALYSIS RELAY
AE	ANALYSIS ELEMENT
AIC	ANALYSIS INDICATING CONTROLLER
AI	ANALYSIS INDICATOR
AIT	ANALYSIS INDICATING TRANSMITTER
AT	ANALYSIS TRANSMITTER
AR	ANALYSIS RECORDER
BA	BURNER ALARM
BE	BURNER ELEMENT
BS	BURNER SWITCH
FAL	FLOW ALARM, LOW
FC	FLOW CONTROLLER
FCV	FLOW CONTROL VALVE
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FIC	FLOW INDICATOR CONTROLLER
FR	FLOW RECORDER
FRC	FLOW RECORDER CONTROLLER
FSH	FLOW SWITCH, HIGH
FT	FLOW TRANSMITTER
FSL	FLOW SWITCH, LOW
FX	FLOW STRAIGHTENING VANES
FY	FLOW RELAY
FV	FLOW VALVE
FQR	FLOW TOTALIZER RECORDER (TICKET PRINTER)
HIC	HAND INDICATING CONTROLLER
HV	HAND VALVE
HS	HAND SWITCH
KC	TIME CONTROLLER
KIC	TIME INDICATING CONTROLLER
LAHH	LEVEL ALARM, HIGH HIGH
LAH	LEVEL ALARM, HIGH
LAL	LEVEL ALARM, LOW
LALL	LEVEL ALARM, LOW LOW
LC	LEVEL CONTROLLER
LCV	LEVEL CONTROL VALVE
LG	LEVEL GAUGE
LN	INTERFACE LEVEL GAUGE
LS	LEVEL SWITCH
LI	LEVEL INDICATOR
LIC	LEVEL INDICATING CONTROLLER
LSH	LEVEL SWITCH, HIGH
LR	LEVEL RECORDER
LRC	LEVEL RECORDER CONTROLLER
LSHH	LEVEL SWITCH, HIGH HIGH
LT	LEVEL TRANSMITTER
LSH/L	LEVEL SWITCH, HIGH LOW
LV	LEVEL VALVE
LY	LEVEL RELAY
ME	MOISTURE ELEMENT
MI	MOISTURE INDICATOR
PE	PRESSURE ELEMENT
PAH	PRESSURE ALARM, HIGH
PAHH	PRESSURE ALARM, HIGH HIGH
PAL	PRESSURE ALARM, LOW
PALL	PRESSURE ALARM, LOW LOW
PC	PRESSURE CONTROLLER
PIC	PRESSURE INDICATING CONTROLLER
PCV	PRESSURE CONTROL VALVE
PDIC	PRESSURE DIFFERENTIAL INDICATING CONTROLLER
PDC	PRESSURE DIFFERENTIAL CONTROLLER
PDSH	PRESSURE DIFFERENTIAL SWITCH, HIGH
PDI	PRESSURE DIFFERENTIAL INDICATOR
PDS	PRESSURE DIFFERENTIAL SWITCH
PI	PRESSURE INDICATOR
PDSL	PRESSURE DIFFERENTIAL SWITCH, LOW
PR	PRESSURE RECORDER
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PRC	PRESSURE RECORDER CONTROLLER
PS	PRESSURE SWITCH
PSH	PRESSURE SWITCH, HIGH
PSHH	PRESSURE SWITCH, HIGH HIGH
PSL	PRESSURE SWITCH, LOW
PSLL	PRESSURE SWITCH, LOW LOW
PSE	PRESSURE SAFETY ELEMENT
PSV	PRESSURE SAFETY VALVE
PIT	PRESSURE INDICATING TRANSMITTER
PT	PRESSURE TRANSMITTER
PY	PRESSURE RELAY
TAH	TEMPERATURE ALARM, HIGH
TAHH	TEMPERATURE ALARM, HIGH HIGH
TAL	TEMPERATURE ALARM, LOW
TALL	TEMPERATURE ALARM, LOW LOW
TC	TEMPERATURE CONTROLLER
TCV	TEMPERATURE CONTROL VALVE
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TIC	TEMPERATURE INDICATOR CONTROLLER
TR	TEMPERATURE RECORDER
TS	TEMPERATURE SWITCH
TSH	TEMPERATURE SWITCH, HIGH
TSL	TEMPERATURE SWITCH, LOW
TT	TEMPERATURE TRANSMITTER
TW	TEMPERATURE WELL
ZSO	LIMIT SWITCH TO PROVE VALVE IN OPEN POSITION
ZSC	LIMIT SWITCH TO PROVE VALVE IN CLOSED POSITION
ZSL	LIMIT SWITCH TO PROVE VALVE IN MIN. STOP POSITION

ABBREVIATIONS (OTHERS THAN INSTRUMENTS)

A	ANALOG SIGNAL
AO	AIR TO OPEN
AC	AIR TO CLOSE
A.S.	AIR SUPPLY
BS&W	BASIC SEDIMENT AND WATER
CCS	CENTRAL CONTROL STATION
CD	CONTINUOUS DRAINER
CPL	COUPLING
DA	DIRECT ACTING
DTA	DETONATION ARRESTER
ES	ELECTRICAL SUPPLY
ESD	EMERGENCY SHUT DOWN
FA	FLAME ARRESTER
FB	FULL BORE
F.L.	FAIL LOCKED
F.C.	FAIL CLOSED
F.O.	FAIL OPEN
MOV	MOTOR OPERATED VALVE
MR	MANUAL RESET
MW	MANWAY
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
RA	REVERSE ACTING
RD	RUPTURE DISK
RO	RESTRICTIVE ORIFICE
SC	SAMPLE CONNECTION
SDV	SHUTDOWN VALVE
STR	STRAINER
SP	SET POINT
SW	SWITCH
CSC	CAR SEAL CLOSED
CSO	CAR SEAL OPEN
MCC	MOTOR CONTROL CENTER
MA	MANUAL ACTUATOR
I.A.S.	INSTRUMENT AIR SUPPLY
I.N.S.	INSTRUMENT NITROGEN SUPPLY
FR	FILTER REGULATOR
G	GENERATOR

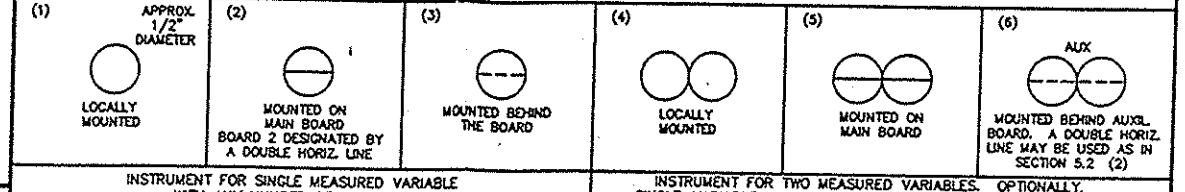
ADDITIONAL INSTRUMENT ABBREVIATION, IF REQUIRED

THE FOLLOWING TABLE IS A GUIDE FOR ADDING ABBREVIATIONS

	USUAL OR PREFERRED USAGE			
	FIRST POSITION	SECOND POSITION	THIRD POSITION	FOURTH POSITION
A	ANALYSIS	ALARM	ALARM	
B	BURNER FLAME	USERS CHOICE	USERS CHOICE	USERS CHOICE
C	CONDUCTIVITY (ELECTRICAL)	CONTROL, CONTROLLER	CONTROL, CONTROLLER	CONTROLLER
D	DENSITY OR SPECIFIC GRAVITY	DIFFERENTIAL		
E	VOLTAGE (EMF)	ELEMENT	ELEMENT	
F	FLOW RATE	FRACTION (RATIO)		
G	GAGING (DIMENSIONAL)	GLASS		
H	HAND INITIATED		HIGH	HIGH
I	CURRENT (ELECTRICAL)	INDICATOR, INDICATING	INDICATOR	INDICATOR
J	POWER	SCAN		
K	TIME	CONTROL STATION	CONTROL STATION	
L	LEVEL	LIGHT (PILOT)	LOW	LOW
M	MOISTURE OR HUMIDITY			
N	USERS CHOICE			
O	USERS CHOICE	ORIFICE (RESTRICTED)		
P	PRESSURE OR VACUUM	POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT	INTEGRATE (TOTALIZE)		
R	RADIOACTIVITY	RECORDER	RECORDER	RECORDER
S	SPEED OR FREQUENCY	SWITCH, SAFETY	SAFETY, SWITCH	
T	TEMPERATURE	TRANSMITTER	TRANSMITTER	
U	MULTIVARIABLE	MULTIFUNCTION		
V	VISCOSITY	VALVE	VALVE	VALVE
W	WEIGHT OR FORCE	WELL		
X	UNCLASSIFIED	UNCLASSIFIED		
Y	USERS CHOICE	RELAY	RELAY	
Z	POSITION	DRIVE, ACTUATE	DRIVE, ACTUATE	

REF. ISA STANDARD S5.1 (ANSI Y32.2 1975)

GENERAL INSTRUMENT SYMBOLS - BALLOONS



INSTRUMENT FOR SINGLE MEASURED VARIABLE WITH ANY NUMBER OF FUNCTIONS.

INSTRUMENT FOR TWO MEASURED VARIABLES. OPTIONALLY, SINGLE-VARIABLE INSTRUMENT WITH MORE THAN ONE FUNCTION. ADDITIONAL TANGENT BALLOONS MAY BE ADDED AS REQUIRED.

DRAWING NUMBER SYSTEM

EXAMPLE

D-XXXXXX-10-101

- 101 — CONSECUTIVE NUMBERS
- 10 — DRAWING CATEGORY
- XXXXX — JOB NUMBER
- D — DRAWING SIZE

DRAWING CATEGORIES

10	PLOT PLANS AND PIPING & INSTRUMENT DIAGRAMS
20	VESSELS
30	CUSTOMER ASSEMBLY & COMPONENT DETAILS
40	VENDOR DIMENSIONAL DRAWINGS
50	PIPING PLANS AND ELEVATIONS
60	ELECTRICAL
70	INSTRUMENTS
80	ANCHOR BOLT PLAN AND FOUNDATION
90	STRUCTURAL
100	MISCELLANEOUS
SPOOLS	USE LINE NUMBERS

LINE NUMBER SYSTEM

EXAMPLE

3"P-1001-A

- A — PIPING SPECIFICATION
- 1001 — CONSECUTIVE NUMBERS
- P — SERVICE
- 3" — LINE SIZE

SERVICE		LINE NUMBERS
PROCESS SYSTEM		
P	LIQUID & VAPOR HYDROCARBONS	1001 - 1999
NG	NATURAL GAS	
CA	CAUSTIC	
AIR SYSTEM		
PA	PLANT AIR	2001 - 2999
IA	INSTRUMENT AIR	
GA	ATOMIZING AIR	
AA	AMBIENT AIR	
DA	COMBUSTION AIR	
WATER SYSTEM		
DW	POTABLE WATER	3001 - 3999
EW	EMERGENCY WATER	
FW	FIRE WATER	
SW	SEAL WATER	
UW	PROCESS WATER	
STEAM & CONDENSATE SYSTEM		
PS	PROCESS STEAM	4001 - 4999
PC	PROCESS CONDENSATE	
DRAIN SYSTEM		
DS	SANITARY SEWER	5001 - 5999
DC	CHEMICAL SEWER	
FUEL SYSTEM		
FG	FUEL GAS	6001 - 6999
PG	PILOT GAS	
IG	IGNITION GAS	
FO	FUEL OIL	

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NOTES:

Notes :

No.	Date	By	Chk'd	App'd	Description

Revisions

Dwg. No.	Subject

Reference Drawings

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Customer: B.F.I.

Drawn	SF
Date	3/1/91
Scale	NONE
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PIPING & INSTRUMENT DIAGRAM
SYMBOL LEGEND SHEET

IT McGill — Pollution Control Systems, Tulsa, Oklahoma

P.O. No.	9539
Jobsite	
Revision No.	0
Drawing No.	D-120575-10-100
Sheet	1 of 1