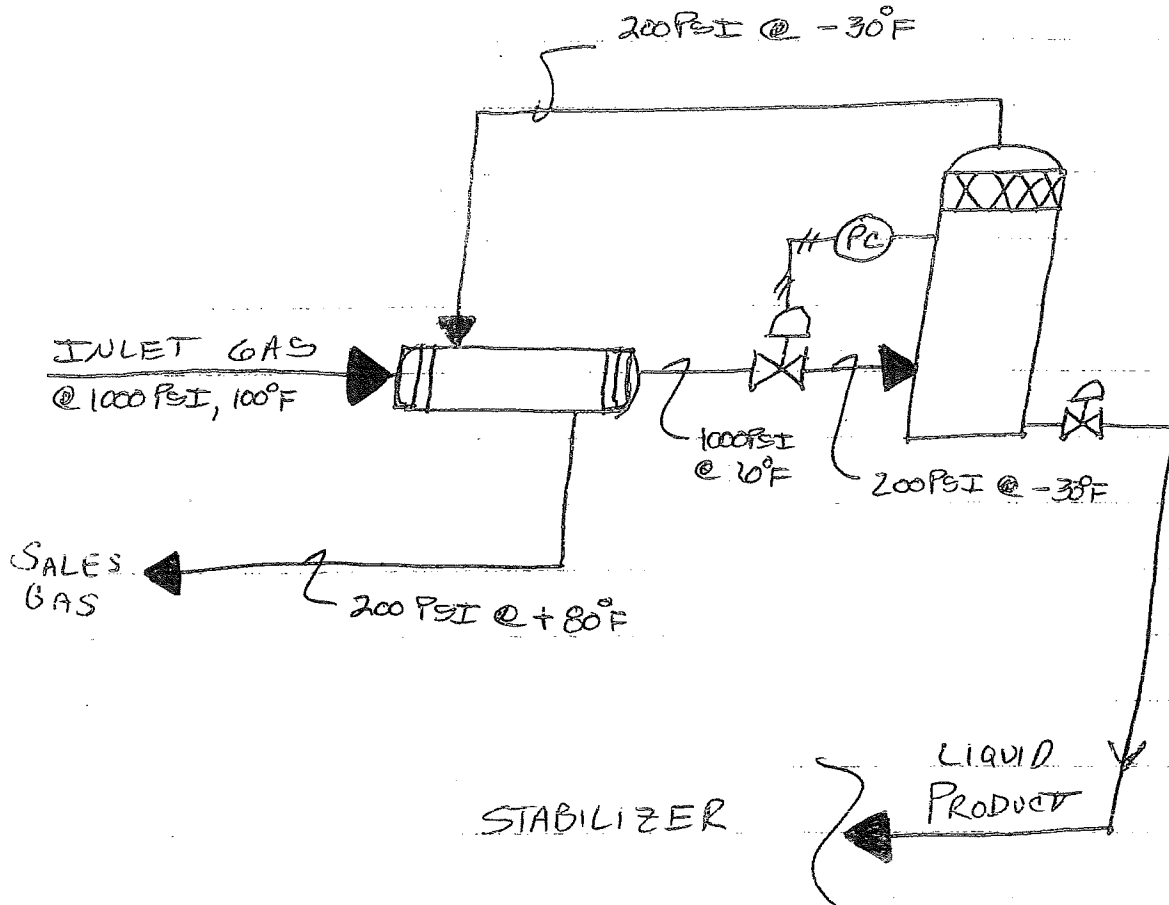
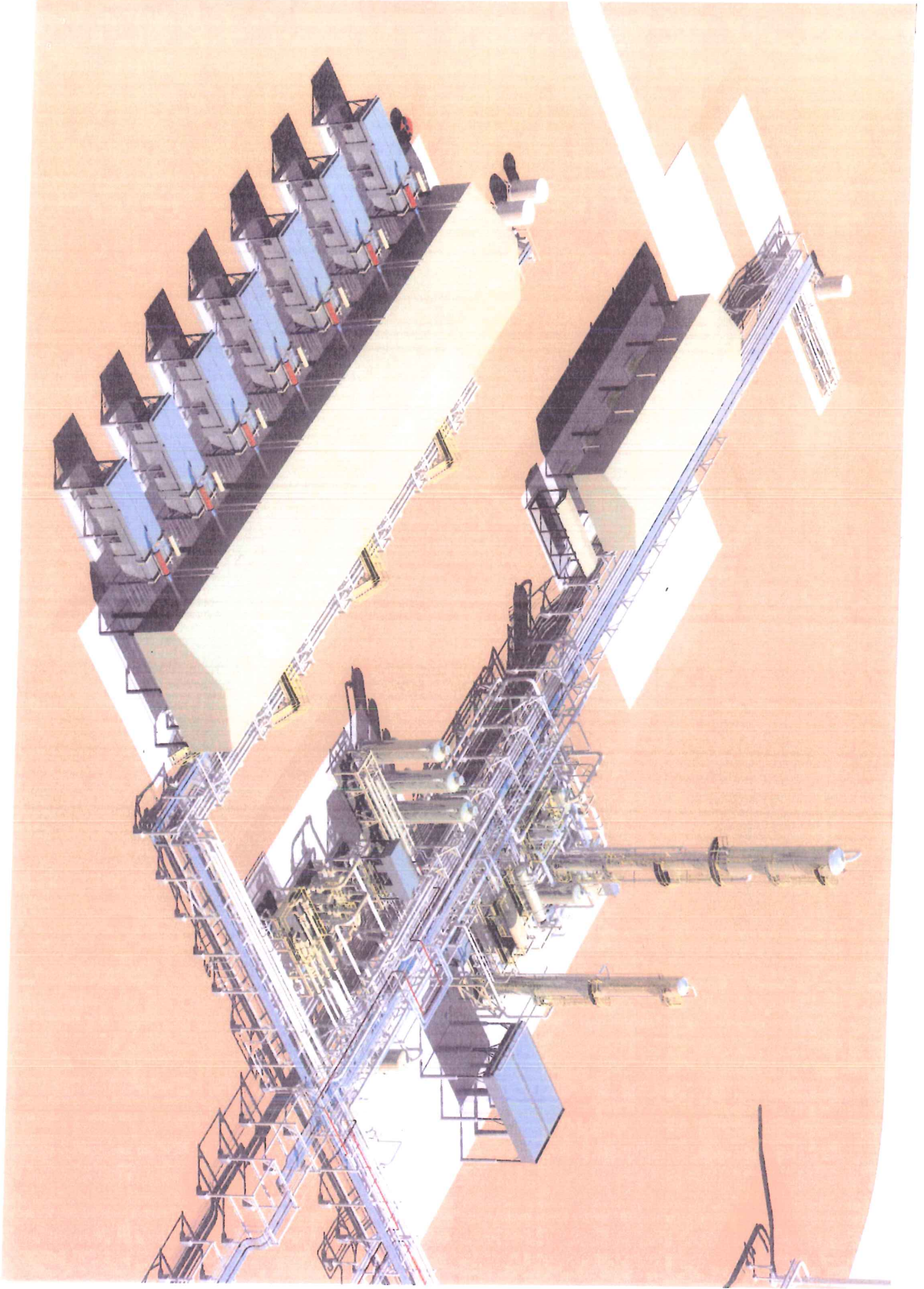


**Typical JT Plant
(Joule Thompson)**

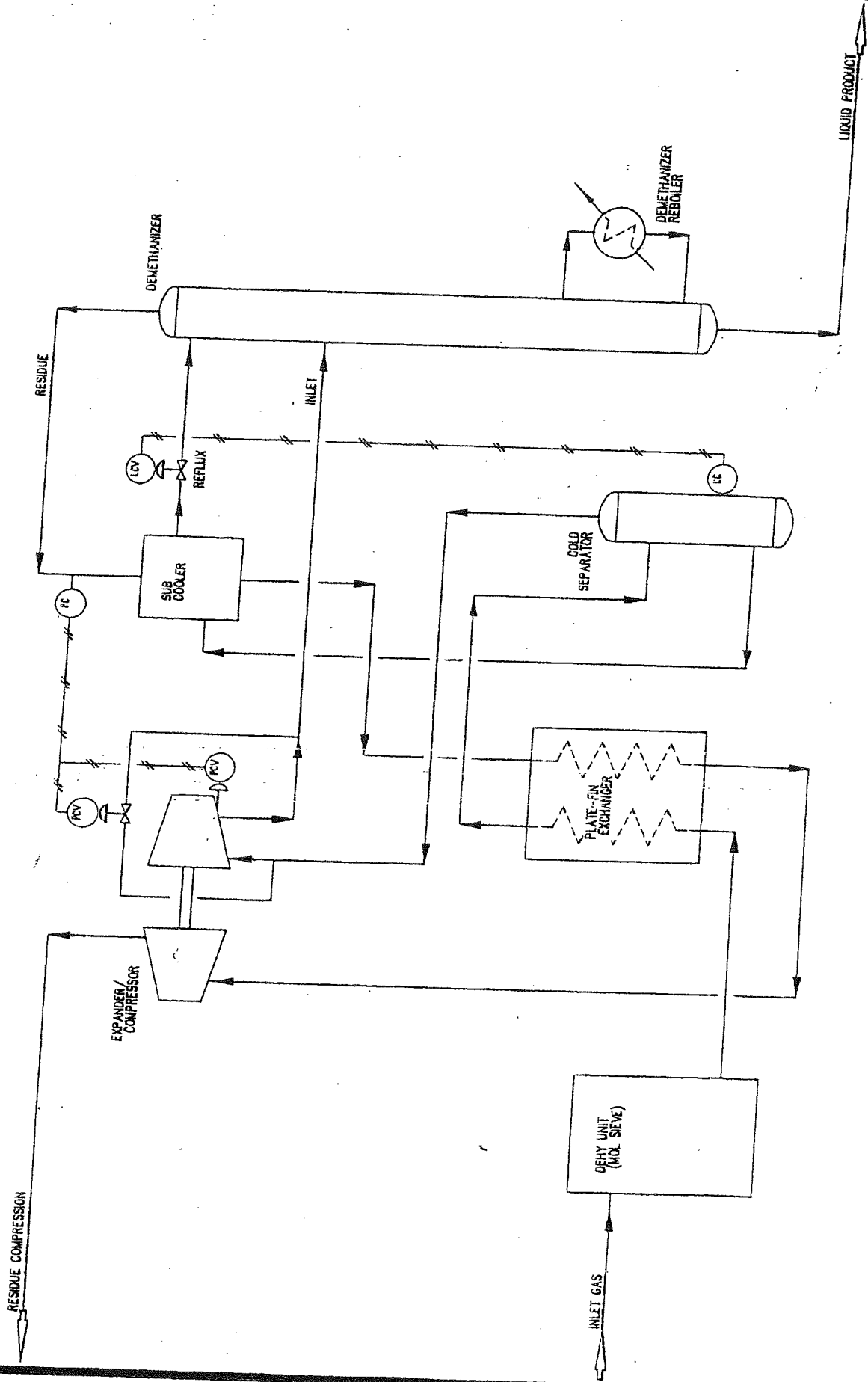




GAS LIQUID RECOVERY

TURBO-EXPANDER

PFD TURBO-EXPANDER UNIT



**BASIC GAS
PROCESSING
INSTRUMENTATION**

**SYMBOLS & CONTROL
TERMINOLOGY**

BASIC GAS PROCESSING INSTRUMENTATION

TYPES OF CONTROLS

- A) PROCESS CONTROL
- B) SAFETY CONTROL

A) PROCESS CONTROL

SYMBOLS & ABBREVIATIONS



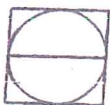
= FIELD MOUNTED



= REMOTE MOUNTED



= LOCAL PANEL MOUNTED




= COMPUTER CONTROL/DISPLAYED


----- = ELECTRONIC SIGNAL

==/== = PNEUMATIC SIGNAL

- LIC = LEVEL INDICATOR CONTROLLER
- PIC = PRESSURE INDICATOR CONTROLLER
- FIC = FLOW INDICATOR CONTROLLER
- TIC = TEMPERATURE INDICATOR CONTROLLER
- LC = LEVEL CONTROLLER
(PC = PRESSURE, FC = FLOW, TC = TEMPERATURE)
- LR = LEVEL RECORDER
(PR = PRESSURE, FR = FLOW, TR = TEMPERATURE)
- LT = LEVEL TRANSMITTER
(PT = PRESSURE, FT = FLOW, TT = TEMPERATURE)

LCV = LEVEL CONTROL VALVE
 (PCV = PRESSURE, FCV = FLOW, TCV = TEMPERATURE)

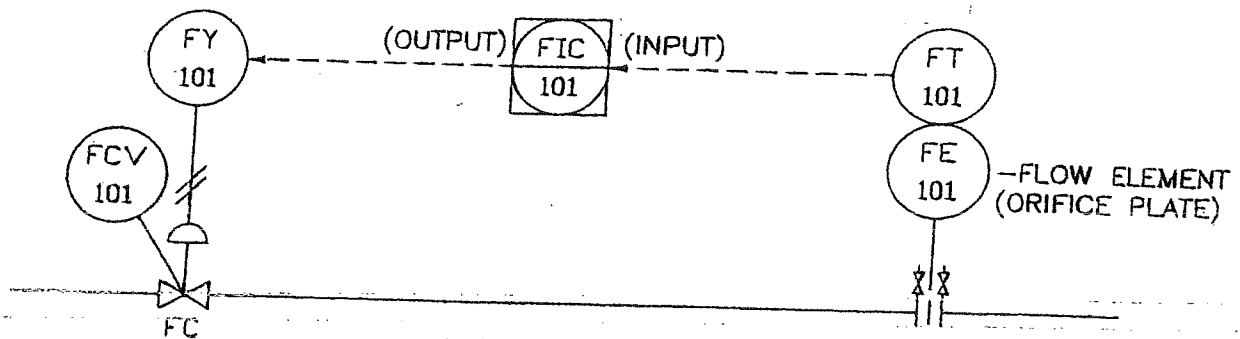
 = FAIL OPEN CONTROL VALVE
 FO

 = FAIL CLOSE CONTROL VALVE
 FC

LY = ELECTRONIC TO PNEUMATIC CONVERTER
 ON LEVEL CONTROL VALVE
 (PY = PRESSURE, FY = FLOW, TY = TEMPERATURE)

PROCESS CONTROLLER DEFINITIONS

CONTROL LOOP (SINGLE "LOOP")



- | | |
|-------------|--|
| MEASUREMENT | - INPUT SIGNAL, WHAT IS BEING CONTROLLED |
| SETPOINT | - WHERE THE MEASUREMENT IS TO BE CONTROLLED |
| OUTPUT | - THE CONTROLLED OUTPUT SIGNAL TO THE DEVICE |

TYPES & ACTIONS OF PROCESS CONTROLLERS

PID - PROPORTIONAL, INTEGRAL, DERIVATIVE

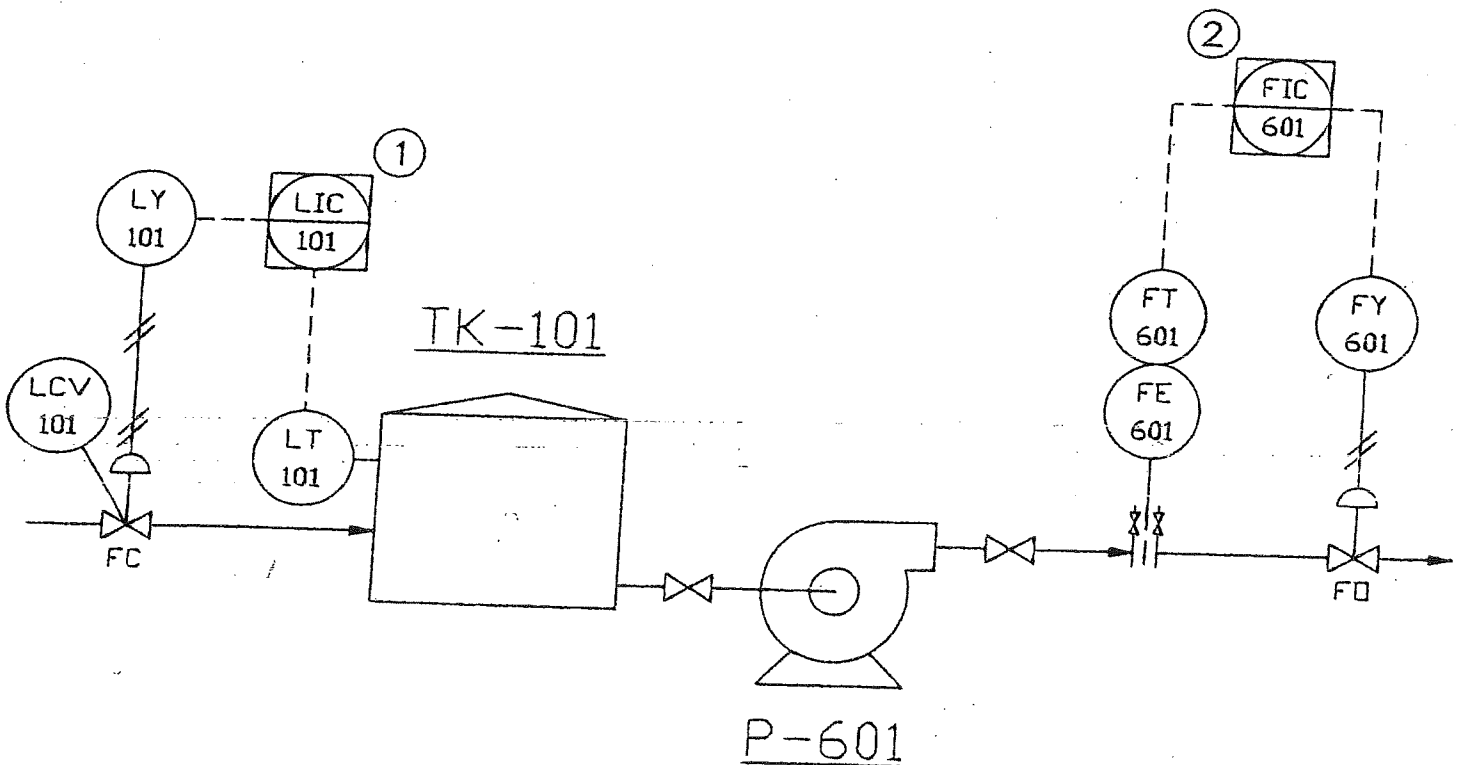
Control Action, Proportional: Control Action in which the controller output has a linear relationship to the error signal.

Control Action, Integral (Reset): Control Action in which the controller output is proportional to the time integral of the error signal.

Control Action, Derivative (Rate): Control Action in which the controller output is proportional to the rate of change of the input.

DIRECT ACTING - INCREASE IN MEASUREMENT RESULTS IN INCREASE IN OUTPUT
 REVERSE ACTING - INCREASE IN MEASUREMENT RESULTS IN INCREASE IN OUTPUT

EXAMPLES:



- ① - THIS LEVEL CONTROL "LOOP" WOULD BE:
 A) REVERSE ACTING
 B) DIRECT ACTING
- ② - THIS FLOW CONTROL "LOOP" WOULD BE:
 A) REVERSE ACTING
 B) DIRECT ACTING

B) SAFETY CONTROL

SYMBOLS & ABBREVIATIONS

(SYMBOLS ARE THE SAME AS SHOWN FOR PROCESS CONTROLS)

LSH = LEVEL SWITCH HIGH (ALARM)

LSHH = LEVEL SWITCH HIGH/HIGH (SHUTDOWN)

(PSH = PRESSURE, FSH = FLOW, TSH = TEMPERATURE)

LAH = LEVEL ALARM HIGH

LSHH = LEVEL ALARM HIGH/HIGH

(PAH = PRESSURE, FAH = FLOW, TAH = TEMPERATURE)

TYPES & DESCRIPTIONS

PROCESS SAFETY DEVICES ARE GENERALLY DISCRETE OR ON/OFF DEVICES.

THEY ARE USED TO INDICATE WHEN THE PROCESS IS OUT OF THE CONTROL PARAMETERS AND TO SHUTDOWN THE EQUIPMENT WHEN EQUIPMENT DAMAGE OR PERSONAL SAFETY IS THREATENED.

EXAMPLES:

