INSTRUMENT LINE DIAGRAMS/IDENTIFICATION SYSTEMS

As used in Instrumentation

TTE TRAINING LIMITED

INSTRUMENT COURSE

SECTION 9A

INSTRUMENT LINE DIAGRAMS/IDENTIFICATION SYSTEMS

SECTION	CONTENT
11.1	Why do we need loop identification systems?
11.2	The lettering system
11.3	Numbering systems
11.4	Summary
11.5	Identification in symbol/diagram form
11.6	Line diagram examples

LOOP IDENTIFICATION SYSTEM

11.1 *Why Do we need Loop Identification systems?*

On large chemical sites it would be hard for a technician to identify each individual instrument without having a given unique reference number for each one. The instrument loop diagram gives information on the details of the actual instruments used, their relation to other instruments in the system (often referred to as an instrument *loop*, and often their physical location.

It must be stressed at this point that the following systems are only to be used as a guide and that you must familiarise yourself with the system in the area you are working in.

11.2 *The lettering system*

The measurements are identified by the following letters:-

F stands for FLOW
P stands for PRESSURE
T stands for TEMPERATURE
L stands for LEVEL
Q stands for ANALYSIS or QUALITY

The second letter indicates what instruments are involved.
They are as follows:-

I - INDICATOR
R - RECORDER
C - CONTROLLER
A - ALARM
Z - SHUT DOWN ACTIVATION

FIRST LETTER		SUCCEEDING LETTERS					
		INDICATOR	INDICATING CONTROLLER	RECORDER	RECORDING CONTROLLER	INDICATING ALARM	SHUTDOWN
		I	IC	R	RC	IA	Z
FLOW	F	FI	FIC	FR	FRC	FIA	FIAZ
PRESSURE	P	PI	PIC	PR	PRC	PIA	PIAZ
TEMP	T	TI	TIC	TR	LRC	TIA	TIAZ
LEVEL	L	LI	LIC	LR	LRC	LIA	LIAZ
QUALITY	Q	QI	QIC	QR	QRC	QIA	QIAZ

Shutdown input Z usually takes the format - FIRZA orFICZA, some systems use an E for shutdown inputs The E denoting Emergency

11.3 *Numbering systems.*

Normally 3 identifying letters appear now making the instrument/ loop exclusive and differentiates this between others of a similar nature. The numbers usually follow the lettering.

A commonly used numbering format is as follows:-

FLOW	-	100 - 199
PRESSURE	-	300 - 399
TEMPERATURE	-	500 - 599
LEVEL	-	600 - 699
QUALITY	-	700 - 799
SPEED	-	800 - 899
WEIGHT	-	900 - 999

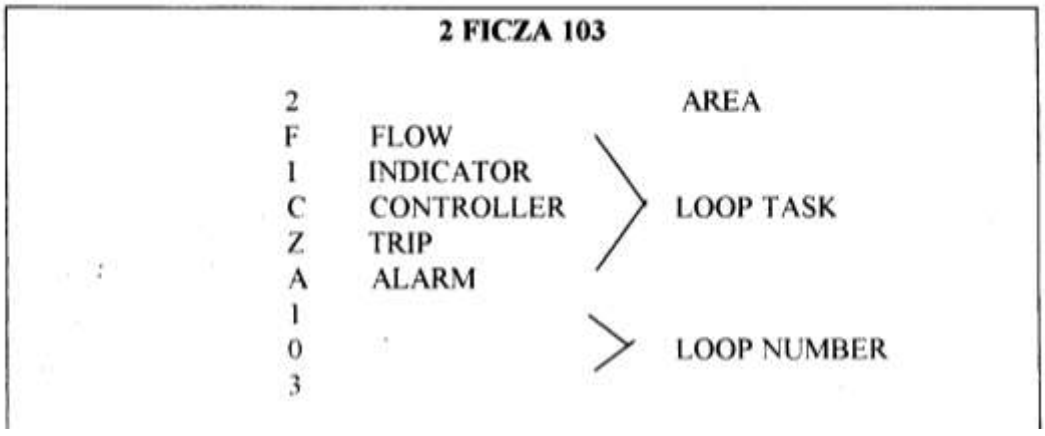
Typical examples of use would be:- FIC 100
FIC 101 etc

LICZA 600
LICZA 601 etc

Where a production plant is split into sections/ or units it is quite often common to see a prefix number, eg:- 2 FIC 100. This would indicate that this loop is to be found in area/ unit 2. This same system could also be employed where there are alot of systems of the same nature.

11.4 *Summary.*

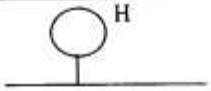
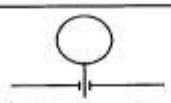
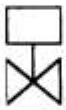
In summary the following diagram represents one form of lettering/ numbering system, it must be reminded to check the system in place in your particular work area:-



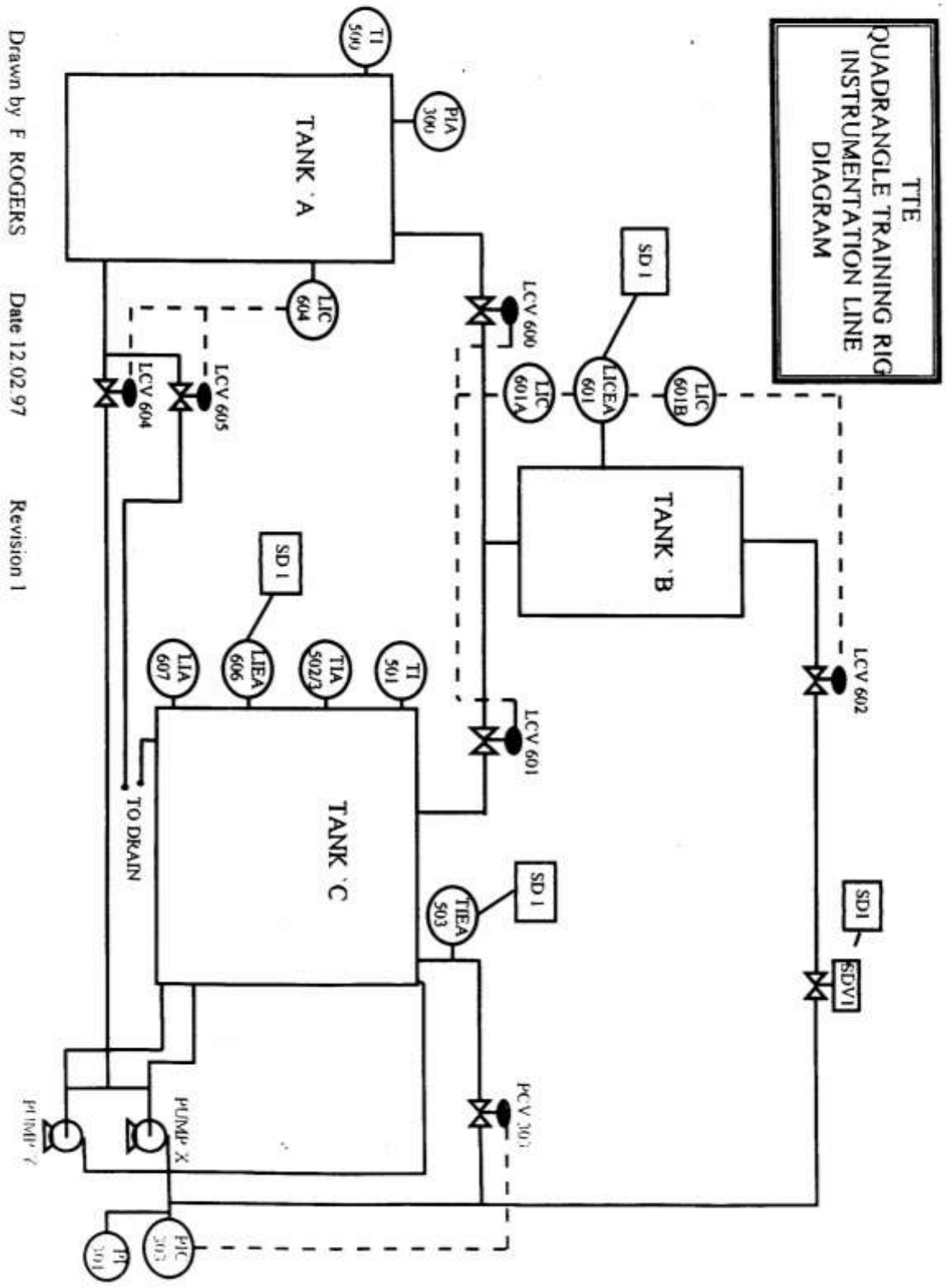
1 1 5 *Identification in symbol diagram form.*

In addition to numbering and lettering, instrumentation systems are recorded in diagram form these enable the technician to identify all the instruments in a specific loop or system. These *line diagrams* can either be of instruments in relation to the plant or as a wiring diagram. Plant diagrams tend to be larger, showing sections of plant and a number of instrument loops whereas the wiring diagram is of a specfic loop only, and concentrates on fine detail. The fine detail goes even as far as individual wire/ terminal numbers.

The following table is a guide to the sorts of symbols in common use. Again always familiarise yourself with the system in operation in your work area.-

Symbol Representation	Description of use
	This is the general symbol for an instrument,with identification lettering and numbers inserted into the circle, or immediately adjacent.
	This is the symbol for an instrument which is mounted in the front of a control panel. Numbers and lettering again situated inside the circle.
	This is the symbol for an instrument located in a field control room.
	This symbol shows an instrument connected to pipeline (or vessel). The addition of a H or L outside the circle identifies this as an instrument with an alarm (HI or LO).
	This symbol represents a flow metering instrument using an orifice plate as its measurement point.
	This symbol represents a control valve. some show the circle as a half moon. The addition of an arrow (pointing up or down) on the centre stem indicates the air fail mode, other characters may be used for other features.
	This symbol is commonly used to represent piston operated valves. This symbol may also be used to denote Shutdown valves again with the addition of arrows to denote the air fail action.
	This type of line represents a process or impulse line. some process lines tend to be thicker.
	This type of line is used to denote an electrical instrument signal line.
	This type of line is used to denote pneumatic-signal lines. Although some used the doted line purely as a general signal line.

This diagram shows a plant instrument line diagram



This diagram shows an instrument wiring line diagram -