

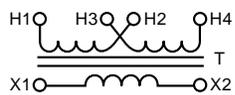
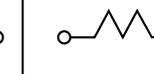
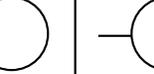
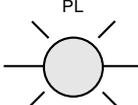
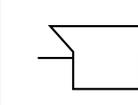
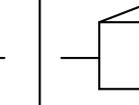
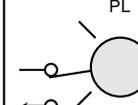
Electrical Relay Diagram and P&ID Symbols

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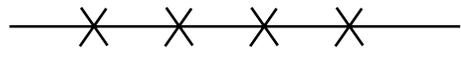
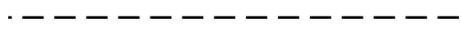
ELECTRICAL RELAY DIAGRAM SYMBOLS

SWITCHES								
Disconnect	Circuit Interrupter	Circuit Breaker	Limit					
			Normally Open	Normally Closed	Neutral Position			
Limit (cont.)		Liquid Level		Vacuum & Pressure		Temperature		
Maintained Position	Proximity Switch Closed	Proximity Switch Open	Normally Open	Normally Closed	Normally Open	Normally Closed	Normally Open	Normally Closed
Flow (Air, Water)		Foot		Toggle	Cable Operated (Emerg.) Switch	Plugging		Nonplug
Normally Open	Normally Closed	Normally Open	Normally Closed					
Plugging w/Lockout Coil	Selector			Rotary Selector				
	2-Position		3-Position		Nonbridging Contacts		Bridging Contacts	
				Total Contacts To Suit Needs				
Thermocouple Switch	Push Buttons				Connections, Etc.			
	Single Circuit	Double Circuit		Maintained Contact	Conductors			
		Normally Open	Mushroom Head		Not Connected	Connected		

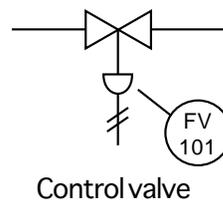
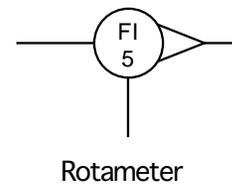
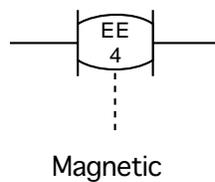
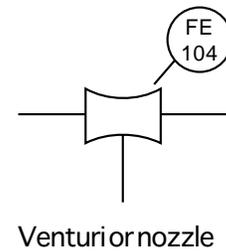
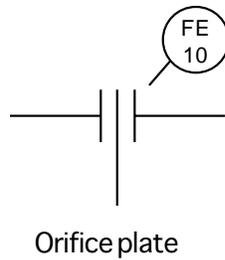
Connections, Etc. (cont.)			Contacts						
Ground	Chassis Or Frame Not Necessarily Grounded	Plug and Recp.	Time Delay After Coil				Relay, Etc.		Thermal Over-Load
			Normally Open	Normally Closed	Normally Open	Normally Closed	Normally Open	Normally Closed	
GRD 	CH 	PL ↓ ↓ ↓ RECP	TR 	TR 	TR 	TR 	CR M CON 	CR M CON 	OL IDL 
Coils									
Relays, Timers, Etc.	Solenoids, Brakes, Etc.				Thermal Overload Element	Control Circuit Transformer			
	General	2-Position Hydraulic	3-Position Pneumatic	2-Position Lubrication					
CR TR M CON 	SOL 	SOL 2-H 	SOL 3-P 	SOL 2-L 	OL IOL 				
Coils (cont.)					Motors				
Reactors (cont.)					3-Phase Motor		DC Motor Armature		
Adjustable Iron Core	Air Core		Magnetic Amplifier Winding						
			MAX 		MTR 		MTR 		
Pilot Lights			Horns, Siren, Etc.		Buzzer		Bell		
PL 			AH 		ABU 		ABE 		
Push to Test PL 									

P&ID SYMBOLS

INSTRUMENT LINE SYMBOLS

	Capillary tube
	Electric signal
	EM, sonic, radioactive
	Hydraulic
	Pneumatic
	Process

SYMBOLS FOR TRANSDUCERS AND ELEMENTS



INSTRUMENT IDENTIFICATION LETTERING

First Letter	Second Letter
A	Analysis
B	Burner, combustion
C	User's choice
D	User's choice
E	Voltage
F	Flowrate
G	User's choice
H	Hand (manually initiated)
I	Current (electric)
J	Power
K	Time or time schedule
L	Level
M	User's choice
N	User's choice
O	User's choice
P	Pressure, vacuum
Q	Quantity
R	Radiation
S	Speed or frequency
T	Temperature
U	Multivariable
V	Vibration, mechanical analysis
W	Weight, force
X	Unclassified**
Y	Event, state, or presence
Z	Position, dimension
	Alarm
	User's choice*
	Control
	Sensory (primary element)
	Glass (sight tube)
	Indicate
	Control station
	Light (pilot)
	User's choice
	Orifice, restriction
	Point (test connection)
	Record or print
	Switch
	Transmit
	Multifunction
	Valve, damper, louver
	Well
	Unclassified
	Relay, compute
	Driver, actuator, unclassified
<p>* User's choice may be used to denote a particular meaning, having one meaning as a first letter and another meaning as a second letter. The user must describe the particular meaning(s) in the legend. This letter can be used repetitively in a particular project.</p> <p>** Unclassified letters may be used only once or to a limited extent. If used, the letter may have one meaning as a first letter and another meaning as a second letter. The user must specify the meaning(s) in the legend.</p>	

Reference: ANSI/ISA-S5.1-1984, *Instrumentation Symbols and Identification*, ISBN0-87664-844-8