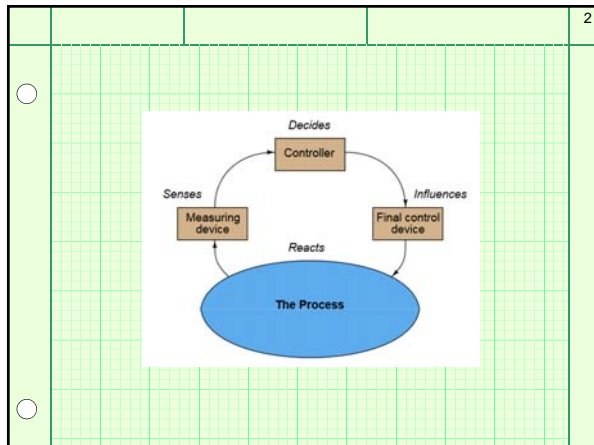


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	<h1>Intro to Industrial Control</h1> <p>Daniel Kohn University of Memphis TECH 3821 Fall 2015 <small>Chp 6-7</small></p>		



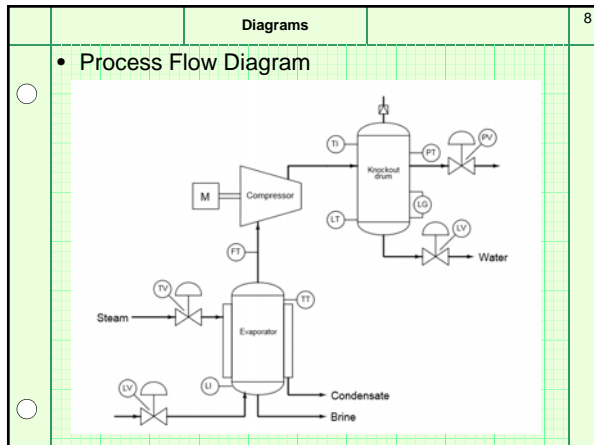
		Definitions	3
	<ul style="list-style-type: none">• Process: The physical system we are attempting to control or measure.• Process Variable (PV): The specific quantity we are measuring in a process.• Setpoint (SP): The value at which we desire the process variable to be maintained at ("target" value for the process variable).		

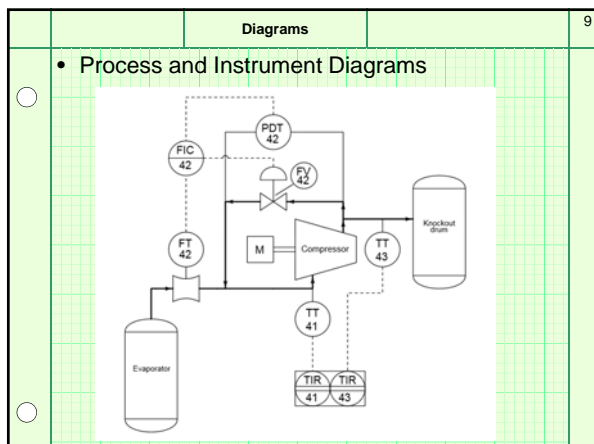
		Definitions	4
<input type="radio"/>	<ul style="list-style-type: none"> • Primary Sensing Element (PSE): A device directly sensing the process variable and translating that sensed quantity into an analog representation (electrical voltage, current, resistance; mechanical force, motion, etc.). 		
<input type="radio"/>	<ul style="list-style-type: none"> • Transducer: A device converting one standardized instrumentation signal into another standardized instrumentation signal, and/or performing some sort of processing on that signal. (Examples: I/P converter (converts 4-20 mA electric signal into 3-15 PSI pneumatic signal) 		

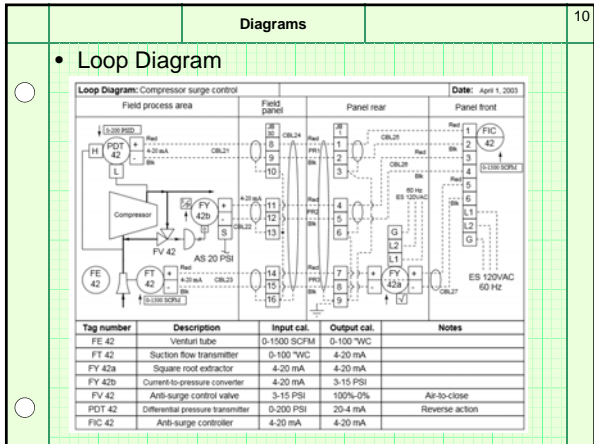
		Definitions	5
<input type="radio"/>	<ul style="list-style-type: none"> • Transmitter: A device translating the signal produced by a primary sensing element (PSE) into a standardized instrumentation signal such as 3-15 PSI air pressure, 4-20 mA DC electric current. 		
<input type="radio"/>	<ul style="list-style-type: none"> • Lower- and Upper-range values (LRV / URV): the values of process measurement deemed to be 0% and 100% of a transmitter's calibrated range. (aka Zero and Span) 		

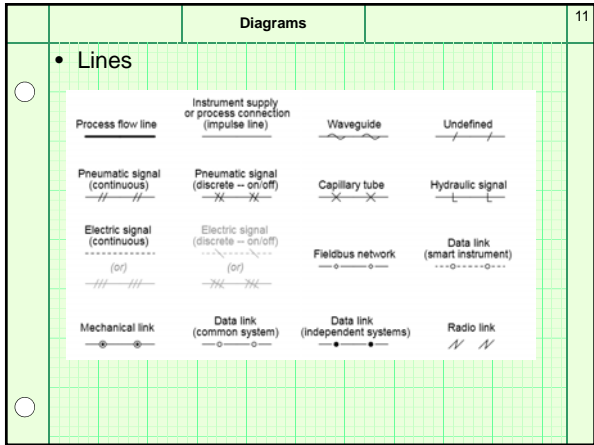
		Definitions	6
<input type="radio"/>	<ul style="list-style-type: none"> • Controller: A device receiving a process variable (PV) signal from a primary sensing element (PSE) or transmitter, comparing that signal to the desired value (called the set point) for that process variable, and calculating an appropriate output signal value to be sent to a final control element (FCE) such as an electric motor or control valve. 		
<input type="radio"/>	<ul style="list-style-type: none"> • Final Control Element (FCE): A device receiving the signal output by a controller to directly influence the process. 		

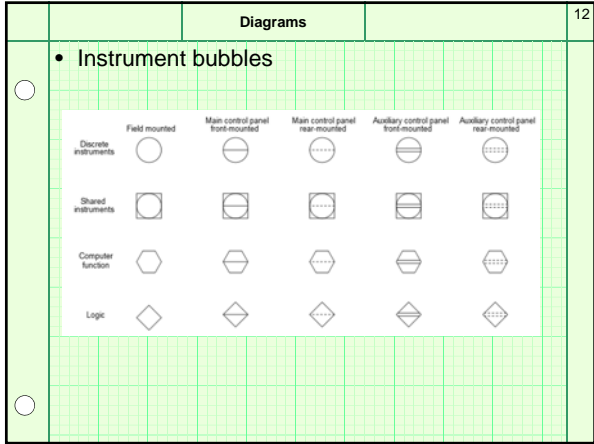
Definitions		7
○	<ul style="list-style-type: none"> • Manipulated Variable (MV): The quantity in a process we adjust or otherwise manipulate in order to influence the process variable (PV). 	
	<ul style="list-style-type: none"> • Automatic mode: When the controller generates an output signal based on the relationship of process variable (PV) to the setpoint (SP). 	
	<ul style="list-style-type: none"> • Manual mode: When the controller's decision-making ability is bypassed to let a human operator directly determine the output signal sent to the final control element. 	

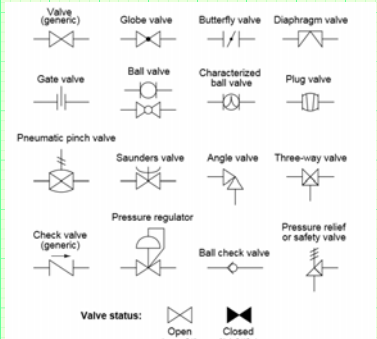


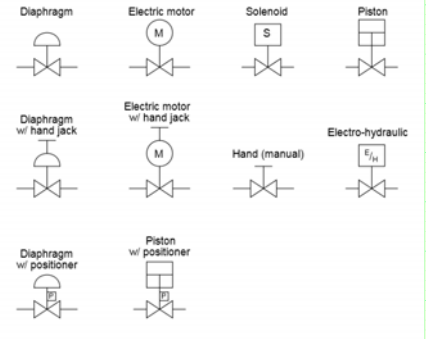


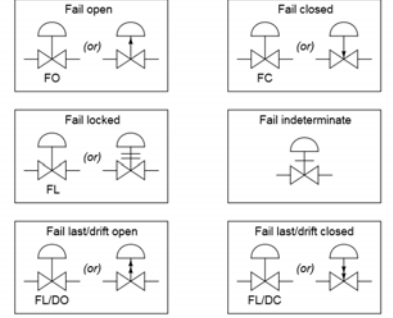


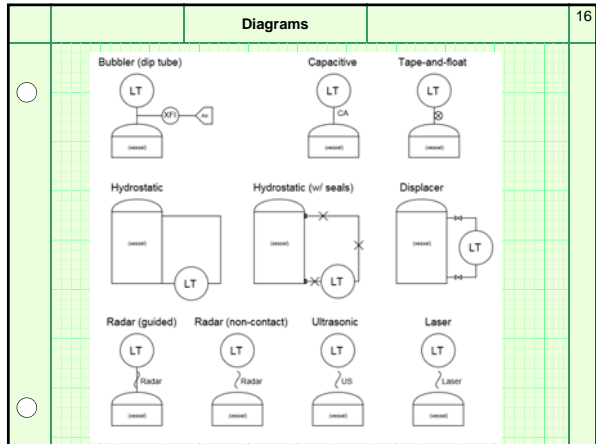


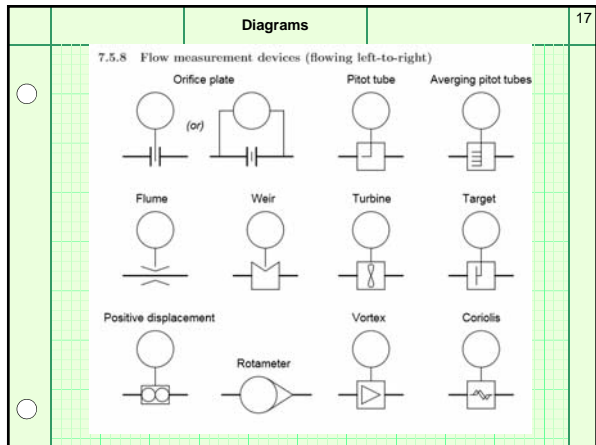


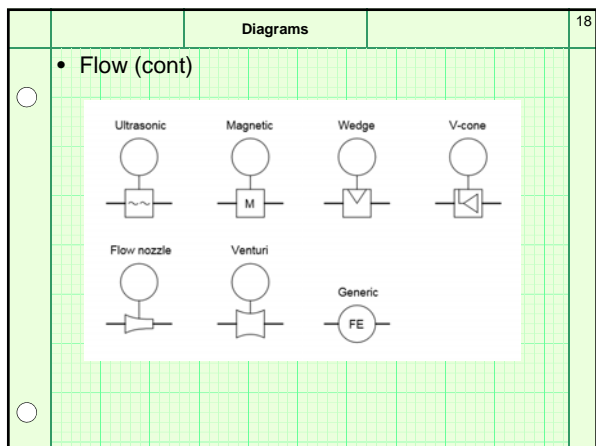
	Diagrams	13
<p>• Process Valves</p> 		

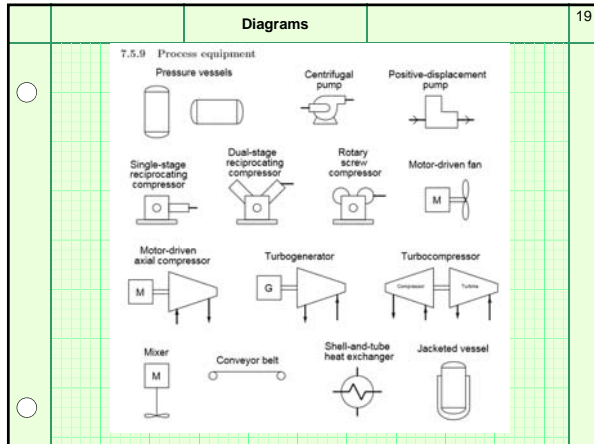
	Diagrams	14
<p>• Valve Actuator Types</p> 		

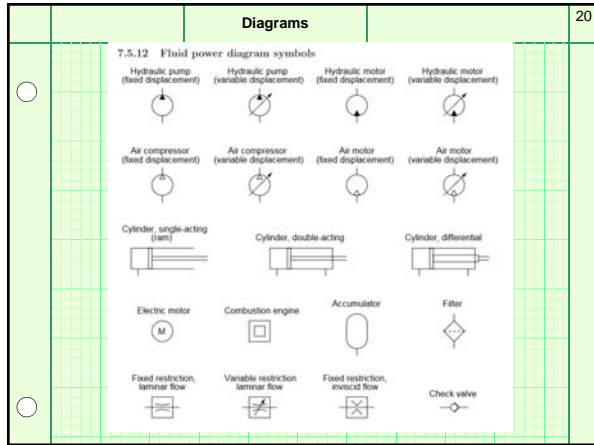
	Diagrams	15
<p>• Valve Failure Modes</p> 		

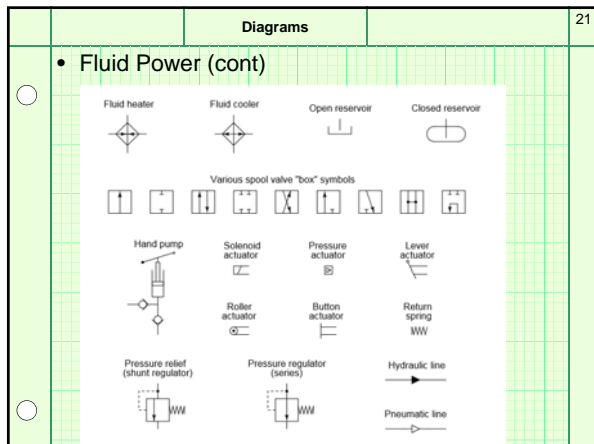












Tags		22	
Instrument Identification Tags - ISA 5.1 standard			
Prefix Letters	Process Variable	Manipulating Variable	Secondary Letters
A	Alarm		
B	Block Indicator	Block Valve	Block Valve
C	Control	Control Valve	Control Valve
D	Disturbance		
E	Emergency		
F	Feed		
G	Gas		
H	Heat		
I	Interlock		
J	Joint		
K	Key		
L	Level		
M	Measurement		
N	Negation		
O	Operational		
P	Pressure		
Q	Quantity		
R	Ratio		
S	Signal		
T	Temperature		
V	Valve		
W	Weight		
X	Exhaust		
Y	Yield		
Z	Zone		

Figure 7-9. ISA-5.1 Identification Letters

