Control fundamentals
HERVAC

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Why do we need controllers?

Save time

Save space

Save material

Prevent error

Gain Efficiency

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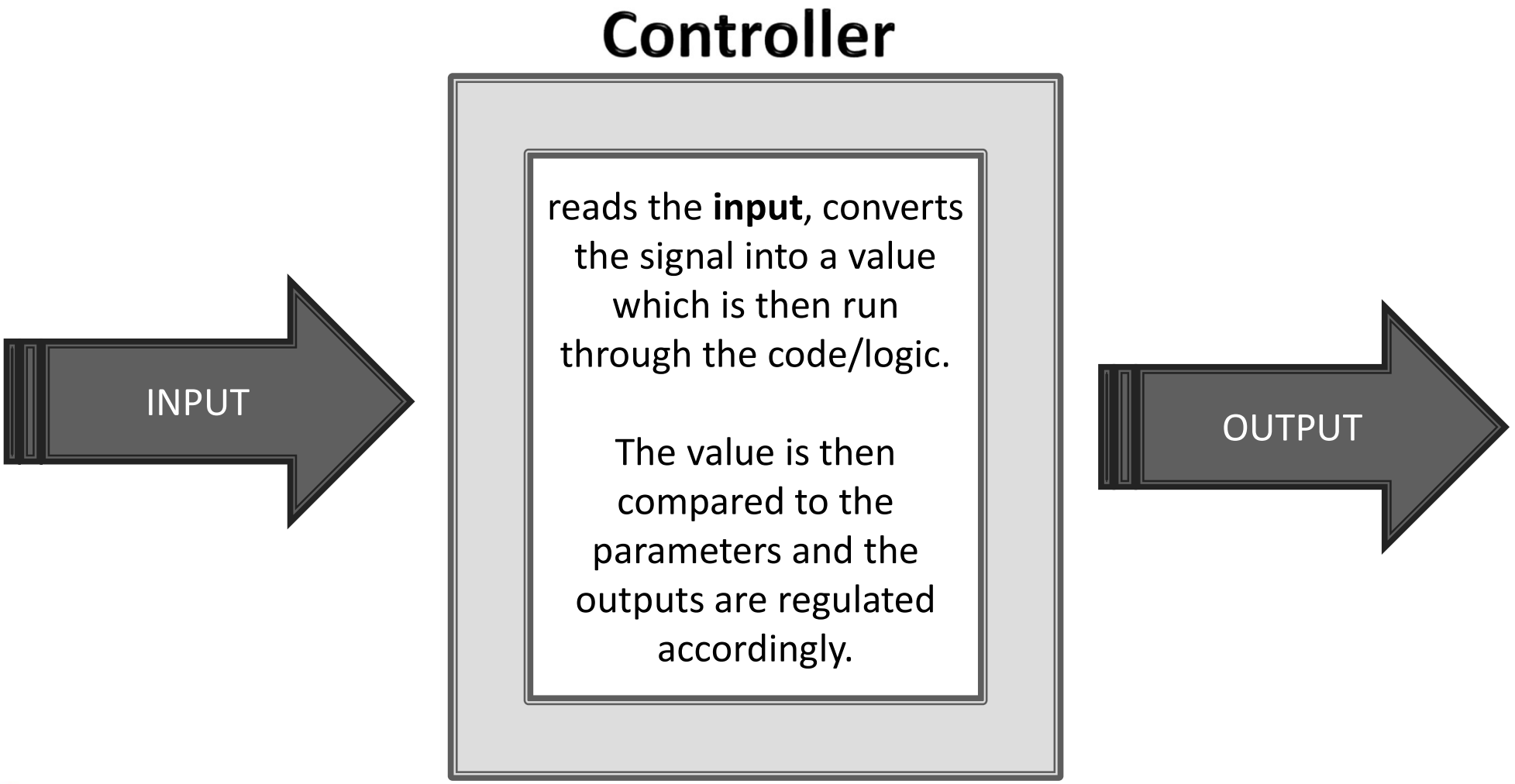
Inputs and Outputs



Inputs and Outputs

ANALOG ~

INPUT (A.I)		OUTPUT (A.O)	
Temperature Resistance inputs:		**0-10Vdc**	Most common, usually used to
NTC			modulate the speed of a Comp VFD
PTC			or EC condenser fans or
PT1000			chilled / hot water actuators
PT100			Fan speed controllers
			3 Way actuator valves etc.
4-20mA inputs:			
Transducers		**4-20mA**	Not so common, same principle
Humidity / Gas sensors			
DC Voltage Inputs:			
Ratiometric			
0-10Vdc signals			
Analog inputs are inputs that vary in value constantly. Depending on how far away these values are from a set point - the controller will know how to govern it's outputs or create alarms etc.			

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Inputs and Outputs

DIGITAL 0 / 1

INPUT (D.I)	OUTPUT (D.O)
Volt Free	A relay output from a controller is either on or off.
24V AC or DC	It usually 'relays' power to a contactor,
220Vac	which in turn starts a
	compressor, or relays power to a solenoid,
Digital inputs are mainly used to give the	starts a fan etc.
controller a 0 / 1, off / on, open / closed	
signal	Relays also feed a voltage signal (220/24/volt free)
	into a digital input of a controller
Then, depending on how the controller is setup	
to manage that digital signal - it will perform a	
certain task, examples:	
Trip a compressor and create an alarm	
Start a defrost cycle	
Change a set point	
Enable a standby mode	

KEYSTAR INDUSTRIES

eliwell by Schneider Electric

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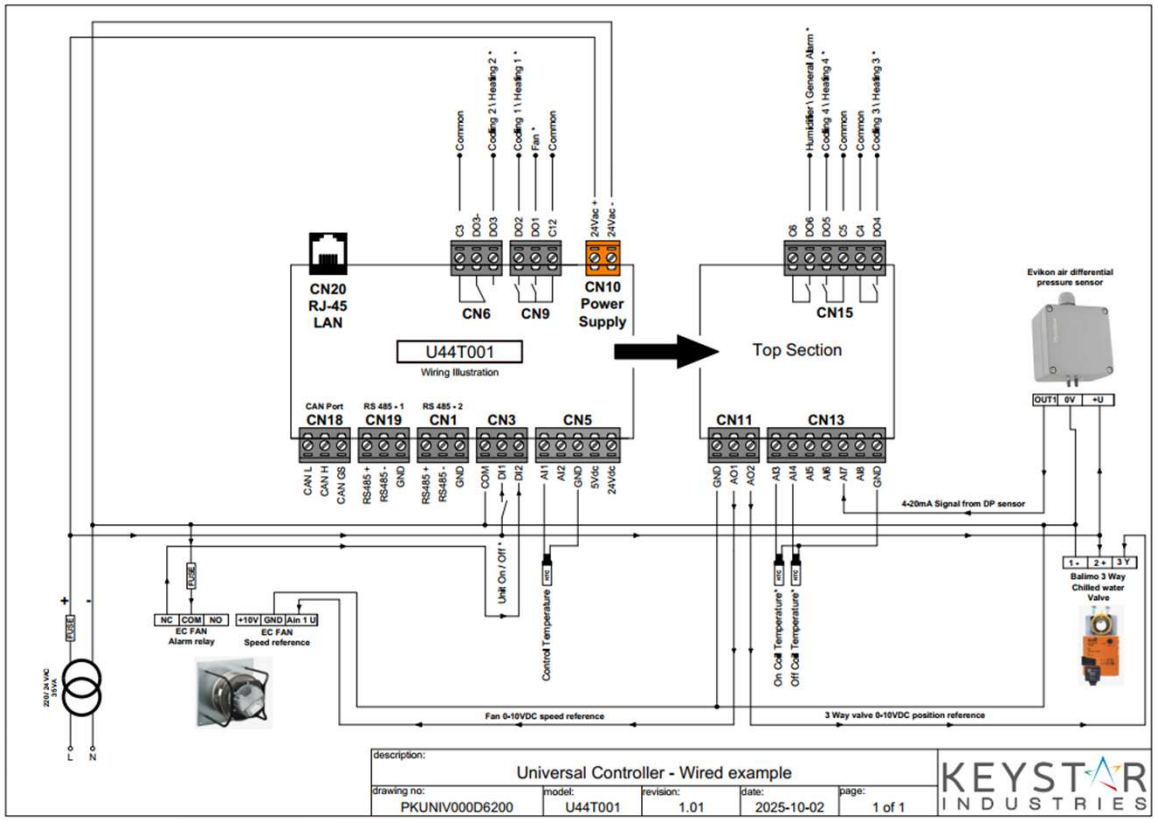
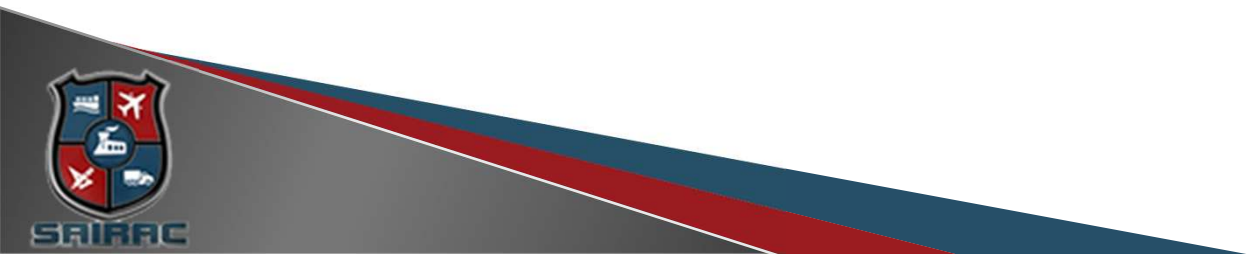
Signal flow direction is critical!

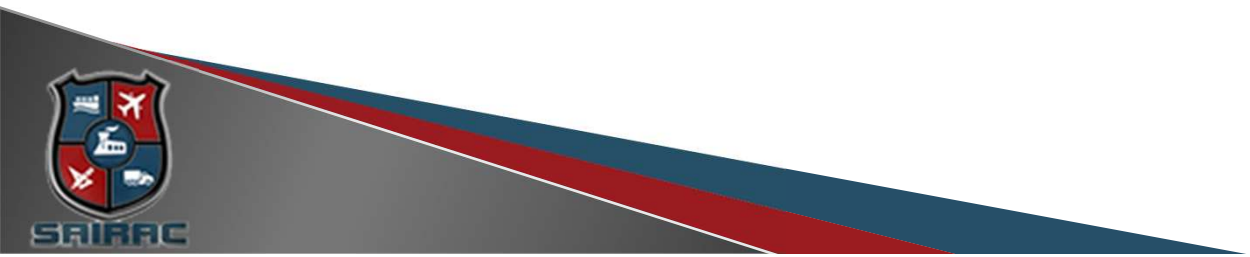
The DIRECTION that your SIGNAL or VOLTAGE FLOWS is CRITICAL!



So how does a controller actually work?



STANDARD SOLUTIONS



What does the future hold?

Moving Beyond the ‘islands of automation’!

A.I Driven Plugins, control and monitoring

Preventative maintenance (without being annoying)

Fuzzy logic?

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Thank you for your attention

- Any Questions ?