

DI04009041: Electrical Control Panels

GTU Course Presentation

July 24, 2026

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- 1 Lecture 1.1: Definition, Purpose, and Applications of Control Panels.
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- 3 Lecture 1.3: Power Devices (ACB, MCCB, MCB, Isolators, Busbars)
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Agenda I

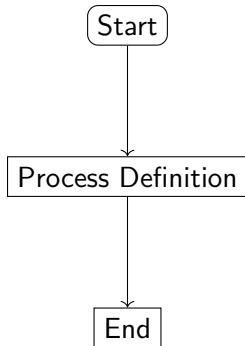
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- Important feature 1
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Parameter	Type A	Type B
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Efficiency	Good	Moderate
Maintenance	Easy	Complex

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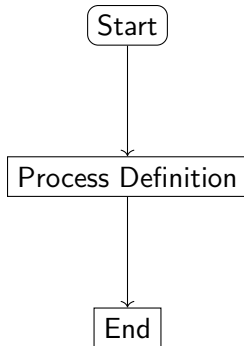
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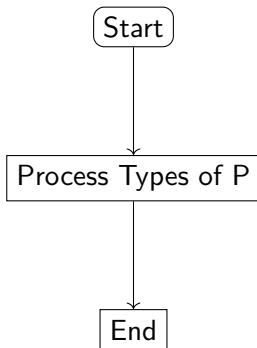
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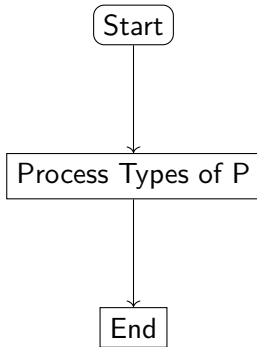
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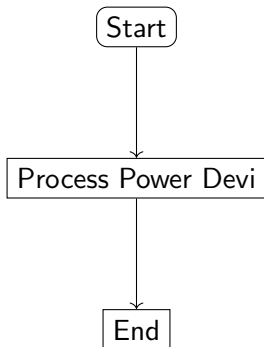
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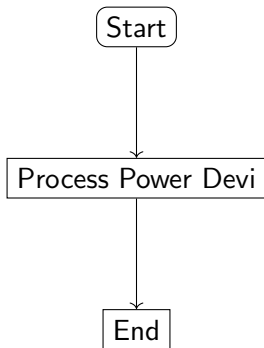
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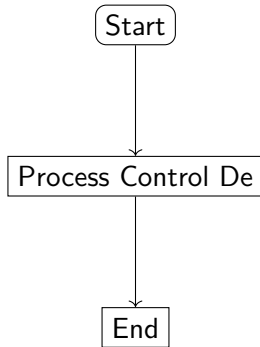
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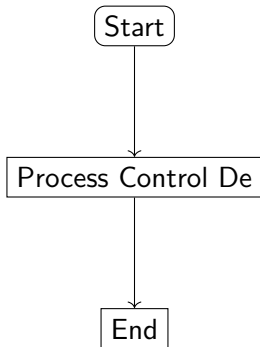
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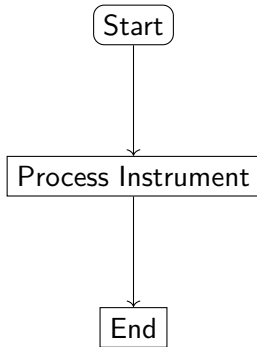
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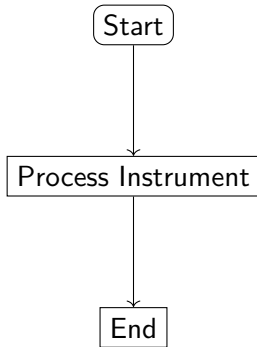
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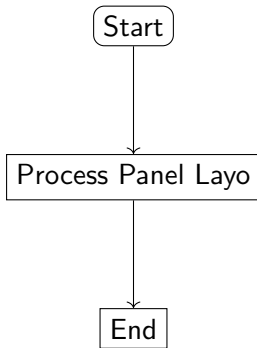
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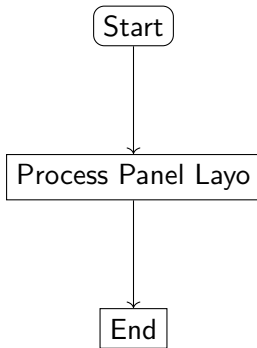
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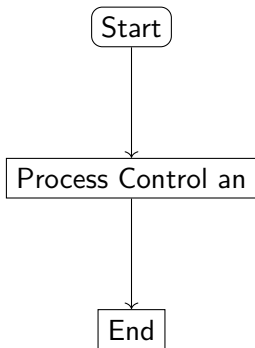
Agenda I

- Control and Power Wiring - Ferruling, Color Coding, Cable Lugs, Termination, Numbering

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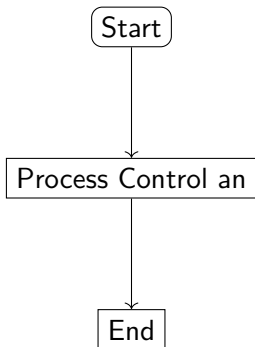
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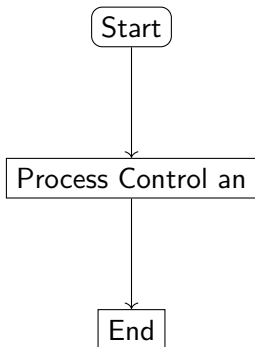
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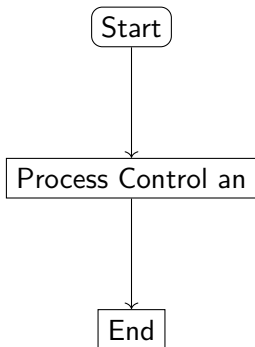
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- Purpose of Motor Control Wiring in Industrial Applications.

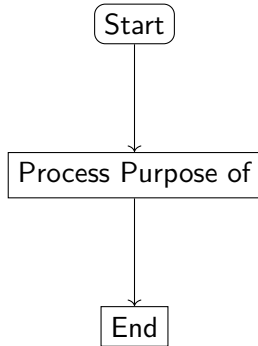
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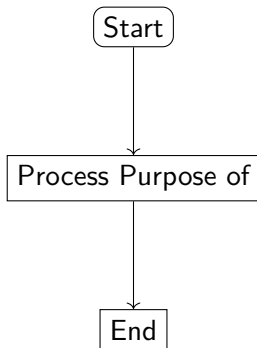
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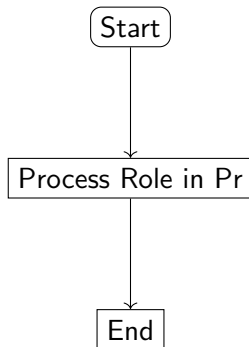
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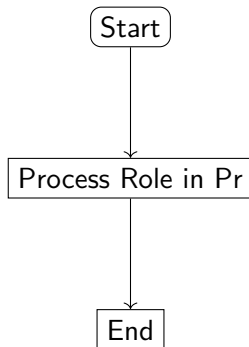
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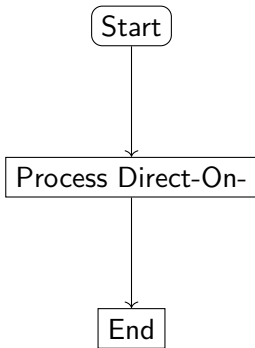
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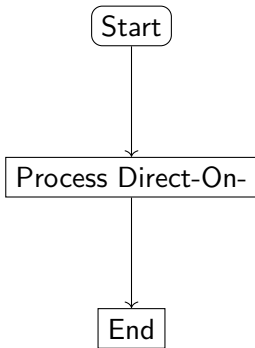
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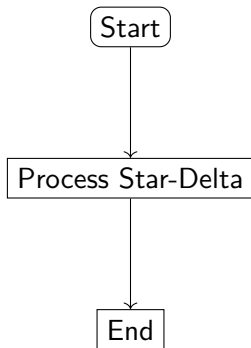
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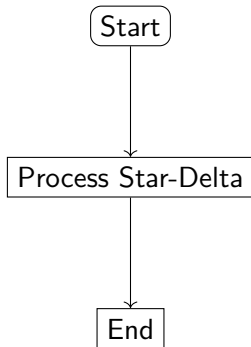
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Agenda I

- Forward-Reverse Motor Control-Wiring for Forward and Reverse Operation, Electrical Interlocks

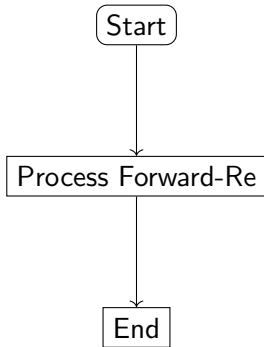
Forward-Reverse Motor Control-Wiring for Forward a... I

Forward-Reverse Motor Control-Wiring for Forward a... Definition

The key definition of Forward-Reverse Motor Control-Wiring for Forward a... involves understanding its core principles.

- Important feature 1
- Important feature 2

Forward-Reverse Motor Control-Wiring for Forward a... I



Forward-Reverse Motor Control-Wiring for Forward a... I

Parameter	Type A	Type B
Cost	High	Low
Efficiency	Good	Moderate
Maintenance	Easy	Complex

Forward-Reverse Motor Control-Wiring for Forward a... |

- Introduction to Forward-Reverse Motor Control-Wiring for Forward a...
- Detailed explanation step 1
- Detailed explanation step 2
- Conclusion of the topic

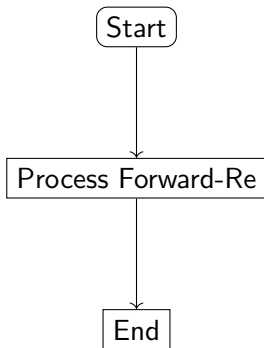
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- Introduction to Forward-Reverse Motor Control-Wiring for Forward a...
- Detailed explanation step 1
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- Conclusion of the topic

Agenda I

- Auto/Manual Motor Control-Use of Selector Switches for Manual and Automatic Operation, Integration with PLCs Or Timer, Wiring for Remote Start/Stop.

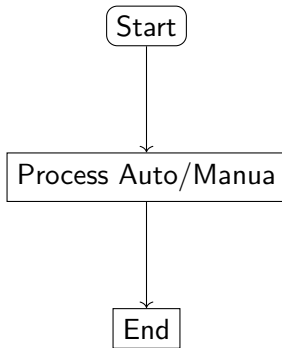
Auto/Manual Motor Control-Use of Selector Switches... I

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- Detailed explanation step 1
- Detailed explanation step 2
- Conclusion of the topic

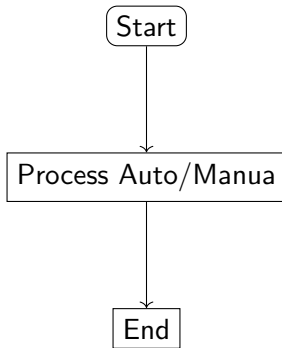
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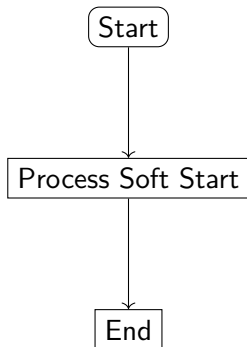
Agenda I

- Soft Starter / VFD Wiring-Basic Control Wiring for Soft Starters, Motor Protection Features, Integration with Control Circuits and Panel Wiring.

Soft Starter / VFD Wiring-Basic Control Wiring for... Definition

The key definition of Soft Starter / VFD Wiring-Basic Control Wiring for... involves understanding its core principles.

- Important feature 1
- Important feature 2



Soft Starter / VFD Wiring-Basic Control Wiring for...

Parameter	Type A	Type B
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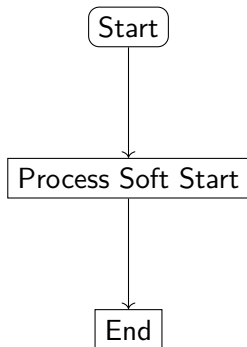
Soft Starter / VFD Wiring-Basic Control Wiring for... I

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- Detailed explanation step 1
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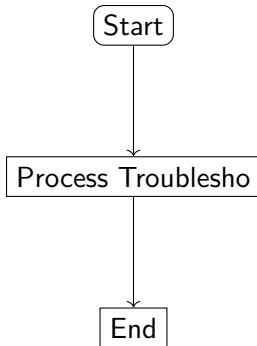
- Troubleshooting Motor Control Wiring

Troubleshooting Motor Control Wiring Definition

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Troubleshooting Motor Control Wiring I



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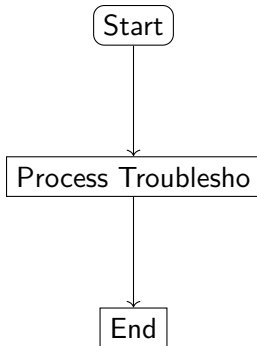
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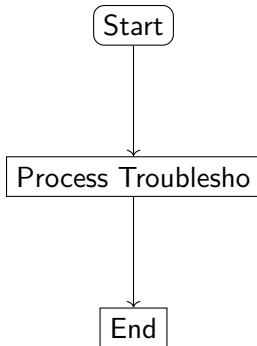
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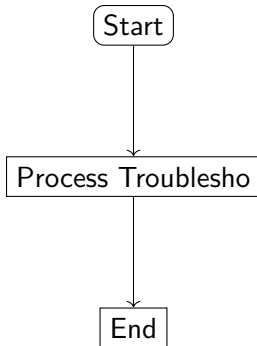
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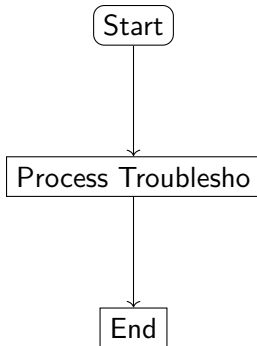
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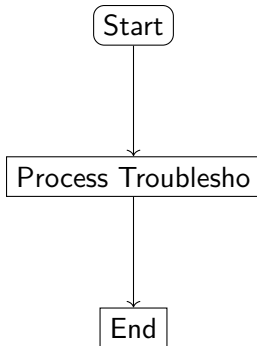
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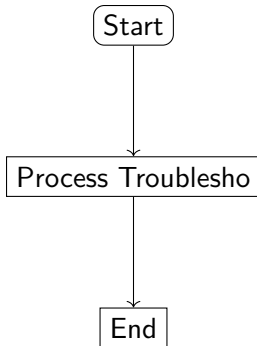
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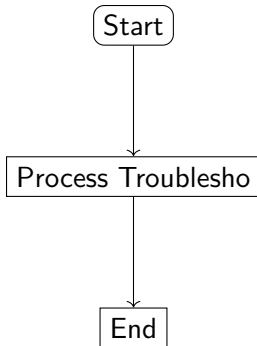
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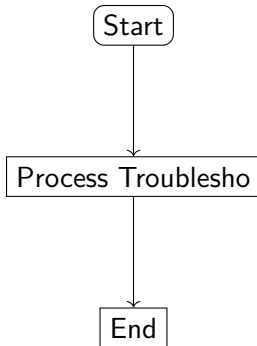
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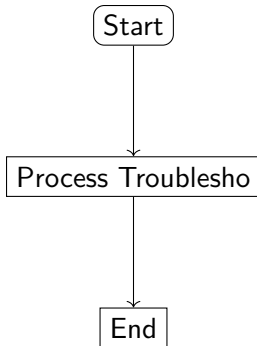
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Agenda I

- Definition and Purpose of Circuit Breaker Control Panels (CBCP) and Relay Panels.
- Single Line Representation of Control & Protection Scheme.

Definition and Purpose of Circuit Breaker Control ...

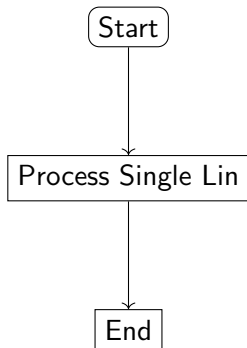
Definition and Purpose of Circuit Breaker Control ... Definition

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- Important feature 1
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Single Line Representation of Control & Protection...

I



Definition and Purpose of Circuit Breaker Control ...

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Single Line Representation of Control & Protection...

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Definition and Purpose of Circuit Breaker Control ...

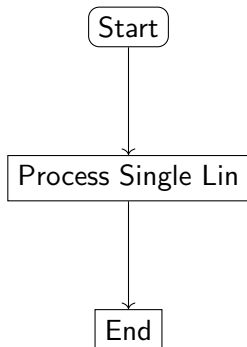
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Definition and Purpose of Circuit Breaker Control ...

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Single Line Representation of Control & Protection...

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- Detailed explanation step 1
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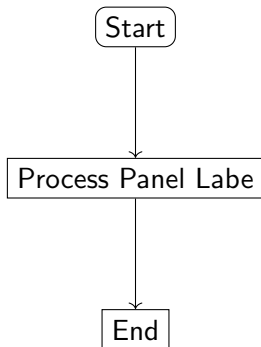
Agenda I

- Front and Rear Layout of Circuit Breaker and Relay Panel
- Panel Labeling, Nameplate Details, and Safety Signage

Front and Rear Layout of Circuit Breaker and Relay... Definition

The key definition of Front and Rear Layout of Circuit Breaker and Relay... involves understanding its core principles.

- Important feature 1
- Important feature 2



Front and Rear Layout of Circuit Breaker and Relay...

Parameter	Type A	Type B
Cost	High	Low
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Panel Labeling, Nameplate Details, and Safety Sign...

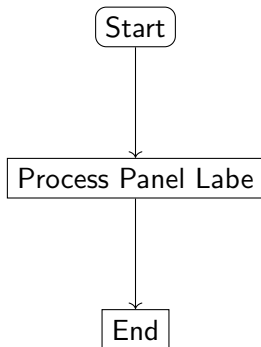
- Introduction to Panel Labeling, Nameplate Details, and Safety Sign...
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Front and Rear Layout of Circuit Breaker and Relay...

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Panel Labeling, Nameplate Details, and Safety Sign...

- Introduction to Panel Labeling, Nameplate Details, and Safety Sign...
- Detailed explanation step 1
- Detailed explanation step 2
- Conclusion of the topic

Agenda I

- Control Wiring of Circuit Breakers (Open/Close/Trip/Health Status)
- Interlocking Between Breakers and Isolators

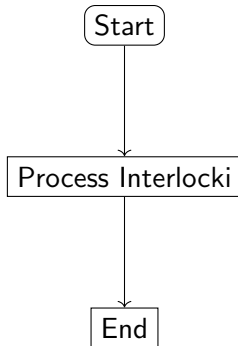
Control Wiring of Circuit Breakers (Open/Close/Tri... I

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Interlocking Between Breakers and Isolators I



Control Wiring of Circuit Breakers

(Open/Close/Tri... I

Parameter	Type A	Type B
Cost	High	Low
Efficiency	Good	Moderate
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Interlocking Between Breakers and Isolators I

- Introduction to Interlocking Between Breakers and Isolators
- Detailed explanation step 1
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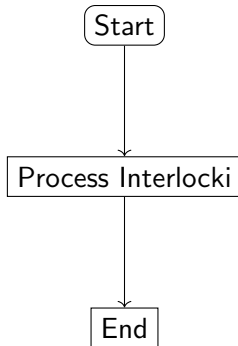
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Interlocking Between Breakers and Isolators I



Control Wiring of Circuit Breakers

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Efficiency	Good	Moderate
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Interlocking Between Breakers and Isolators I

- Introduction to Interlocking Between Breakers and Isolators
- Detailed explanation step 1
- Detailed explanation step 2
- Conclusion of the topic

Agenda I

- Components of Breaker Control Panel
- Spring Charging Motor Control Wiring and Interlocks

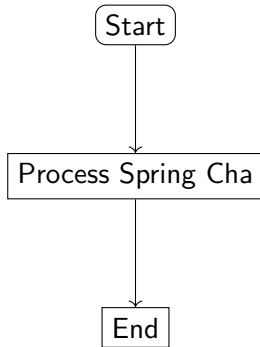
Components of Breaker Control Panel I

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Spring Charging Motor Control Wiring and Interlock... I



Components of Breaker Control Panel I

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Spring Charging Motor Control Wiring and Interlock... I

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- Detailed explanation step 1
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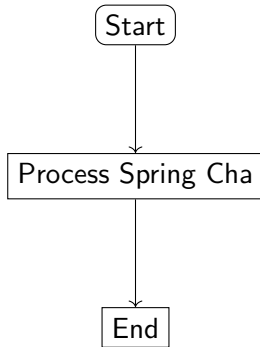
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Spring Charging Motor Control Wiring and Interlock... I



Components of Breaker Control Panel I

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Spring Charging Motor Control Wiring and Interlock... I

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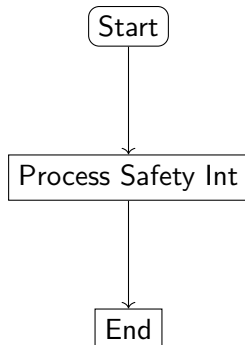
Agenda I

- Remote Control and Scada Interface Provisions
- Safety Interlocks and Trip Circuit Supervision Relay

Remote Control and Scada Interface Provisions Definition

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- Important feature 1
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Remote Control and Scada Interface Provisions I

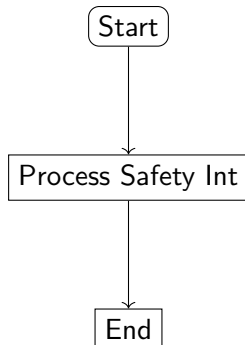
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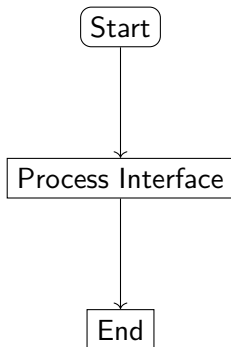
- Mounting and Wiring of Protection Relays on Panel
- Interface Between Control Panel and Switchyard Equipment

Mounting and Wiring of Protection Relays on Panel Definition

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Interface Between Control Panel and Switchyard Equ... I



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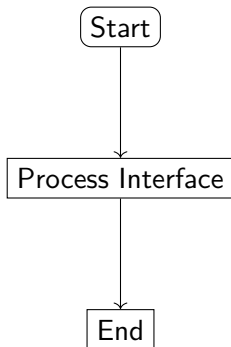
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Agenda I

- Pre-Commissioning Checks for Circuit Breaker and Relay Panels
- Trip Circuit Continuity and Supervision Testing

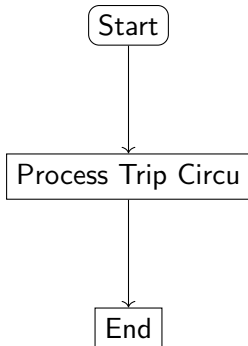
Pre-Commissioning Checks for Circuit Breaker and R... I

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Trip Circuit Continuity and Supervision Testing I



Pre-Commissioning Checks for Circuit Breaker and R... I

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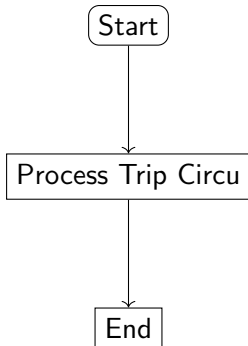
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Pre-Commissioning Checks for Circuit Breaker and R... I

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Trip Circuit Continuity and Supervision Testing I

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Agenda I

- Troubleshooting of Panels

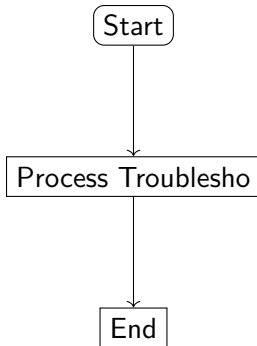
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- Introduction to Troubleshooting of Panels
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- Detailed explanation step 2
- Conclusion of the topic

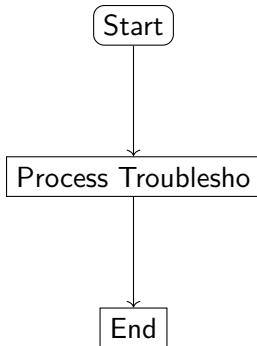
Troubleshooting of Panels I

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- Important feature 1
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Troubleshooting of Panels I



Troubleshooting of Panels I

Parameter	Type A	Type B
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Maintenance	Easy	Complex

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Agenda I

- Troubleshooting of Panels

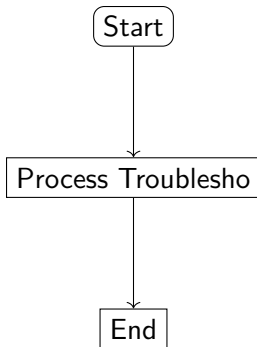
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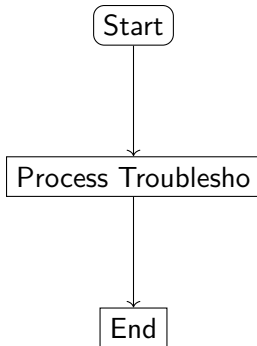
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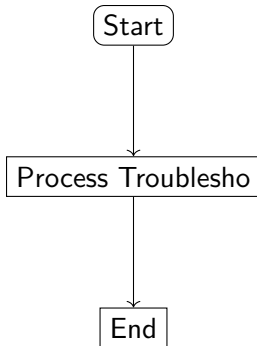
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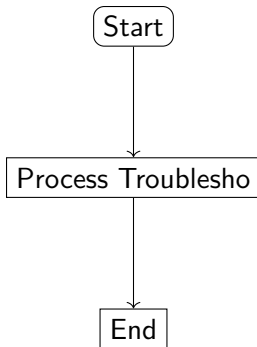
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Agenda I

- Troubleshooting of Panels

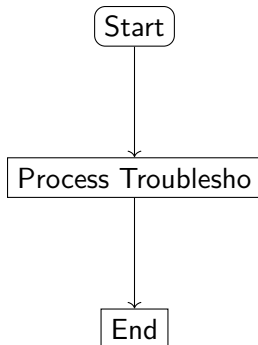
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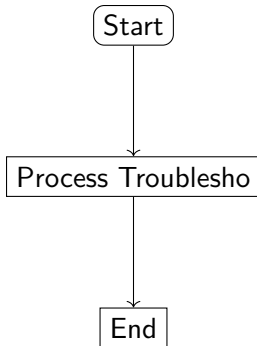
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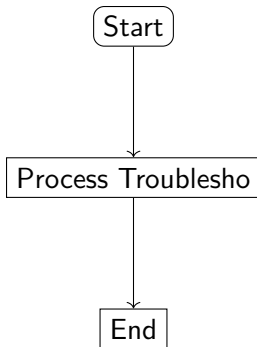
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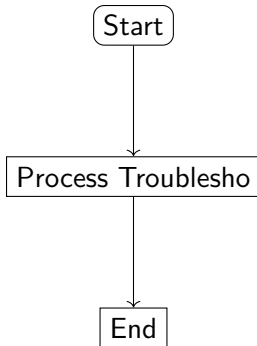
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- Detailed explanation step 1
- Detailed explanation step 2
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Agenda I

- Purpose and Necessity of DG Set Control and Synchronization Panel in Industries and Power System
- Manual DG Set Panel

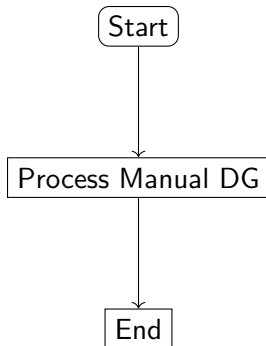
Purpose and Necessity of DG Set Control and Synchron... I

Purpose and Necessity of DG Set Control and Synchron... Definition

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- Important feature 1
- Important feature 2

Manual DG Set Panel I



Purpose and Necessity of DG Set Control and Synchron... I

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Cost	High	Low
Efficiency	Good	Moderate
Maintenance	Easy	Complex

Manual DG Set Panel I

- Introduction to Manual DG Set Panel
- Detailed explanation step 1
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- Conclusion of the topic

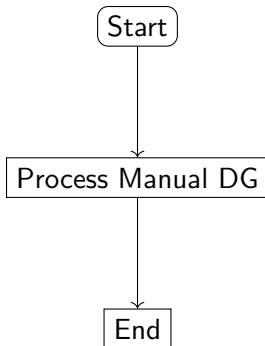
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Manual DG Set Panel I



Purpose and Necessity of DG Set Control and Synchroniz... I

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Cost	High	Low
Efficiency	Good	Moderate
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Manual DG Set Panel I

- Introduction to Manual DG Set Panel
- Detailed explanation step 1
- Detailed explanation step 2
- Conclusion of the topic

Agenda I

- AMF (Automatic Mains Failure) Panel
- ATS (Automatic Transfer Switch) Panel

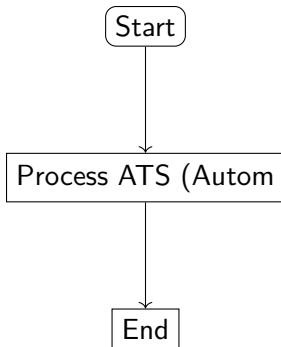
AMF (Automatic Mains Failure) Panel I

AMF (Automatic Mains Failure) Panel Definition

The key definition of AMF (Automatic Mains Failure) Panel involves understanding its core principles.

- Important feature 1
- Important feature 2

ATS (Automatic Transfer Switch) Panel I



AMF (Automatic Mains Failure) Panel I

Parameter	Type A	Type B
Cost	High	Low
Efficiency	Good	Moderate
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ATS (Automatic Transfer Switch) Panel I

- Introduction to ATS (Automatic Transfer Switch) Panel
- Detailed explanation step 1
- Detailed explanation step 2
- Conclusion of the topic

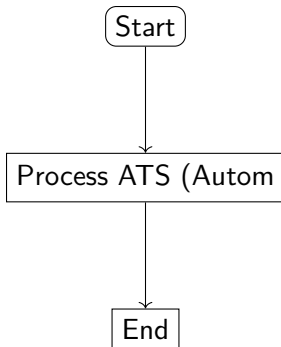
AMF (Automatic Mains Failure) Panel I

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ATS (Automatic Transfer Switch) Panel I



AMF (Automatic Mains Failure) Panel I

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ATS (Automatic Transfer Switch) Panel I

- Introduction to ATS (Automatic Transfer Switch) Panel
- Detailed explanation step 1
- Detailed explanation step 2
- Conclusion of the topic

Agenda I

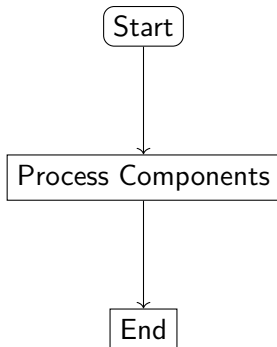
- Auto Start/Stop DG Panels
- Components of DG Set Control Panel

Auto Start/Stop DG Panels Definition

The key definition of Auto Start/Stop DG Panels involves understanding its core principles.

- Important feature 1
- Important feature 2

Components of DG Set Control Panel I



Auto Start/Stop DG Panels I

Parameter	Type A	Type B
Cost	High	Low
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Components of DG Set Control Panel I

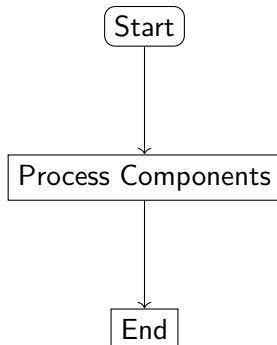
- Introduction to Components of DG Set Control Panel
- Detailed explanation step 1
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Auto Start/Stop DG Panels Definition

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Components of DG Set Control Panel I



Auto Start/Stop DG Panels I

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Components of DG Set Control Panel I

- Introduction to Components of DG Set Control Panel
- Detailed explanation step 1
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Agenda I

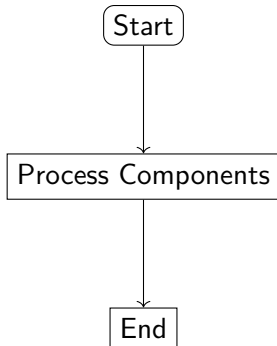
- DG Set-Control Circuit and Power Circuit Wiring
- Components of Synchronization Panel

DG Set-Control Circuit and Power Circuit Wiring Definition

The key definition of DG Set-Control Circuit and Power Circuit Wiring involves understanding its core principles.

- Important feature 1
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Components of Synchronization Panel I



DG Set-Control Circuit and Power Circuit Wiring I

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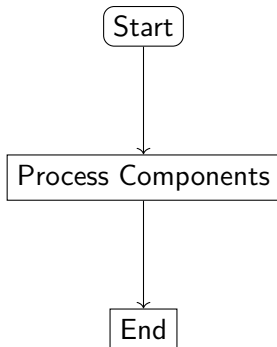
- Introduction to Components of Synchronization Panel
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DG Set-Control Circuit and Power Circuit Wiring Definition

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DG Set-Control Circuit and Power Circuit Wiring I

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Components of Synchronization Panel I

- Introduction to Components of Synchronization Panel
- Detailed explanation step 1
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- Conclusion of the topic

Agenda I

- Synchronization Panel -Power and Control Circuit Wiring
- Troubleshooting

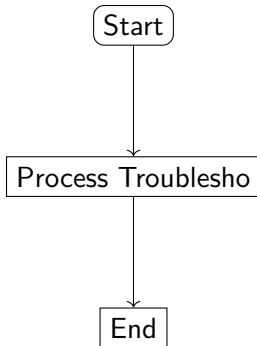
Synchronization Panel -Power and Control Circuit W... I

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Troubleshooting I



Synchronization Panel -Power and Control Circuit

W... I

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Troubleshooting I

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- Detailed explanation step 1
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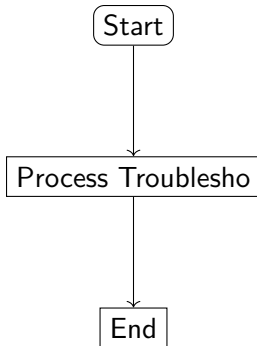
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Troubleshooting I



Synchronization Panel -Power and Control Circuit

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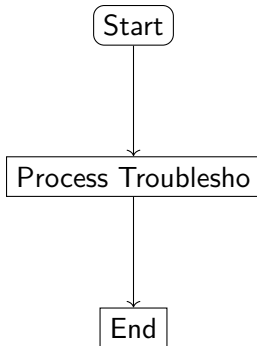
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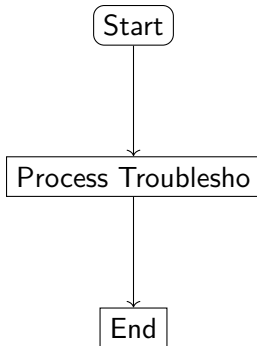
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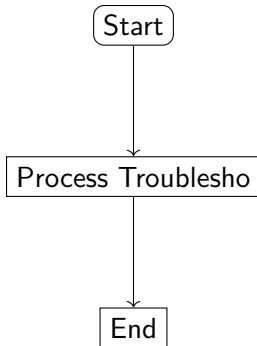
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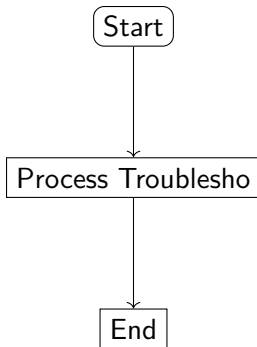
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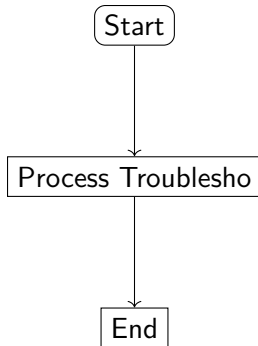
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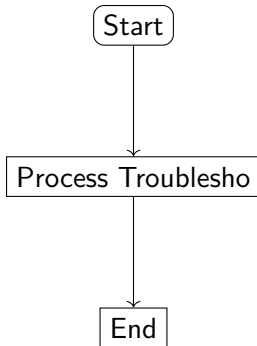
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Agenda I

- Purpose of APFC Panel

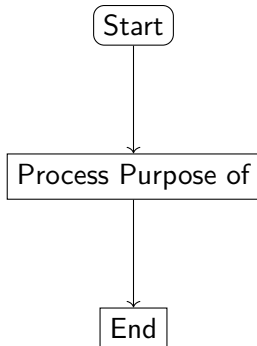
Purpose of APFC Panel I

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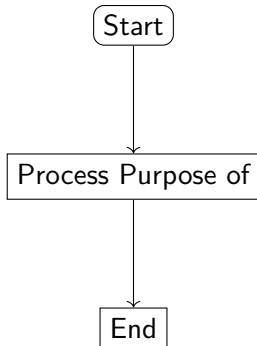
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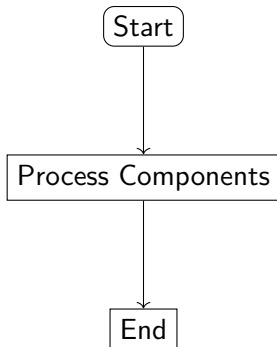
- Components of APFC Panel

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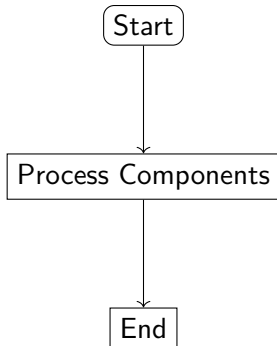
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Components of APFC Panel I

- Introduction to Components of APFC Panel
- Detailed explanation step 1
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Agenda I

- Working Principle of APFC Panel

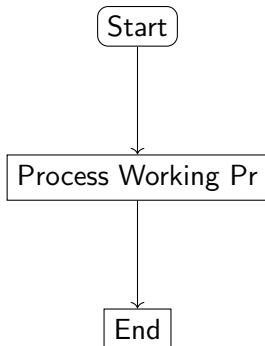
Working Principle of APFC Panel I

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Working Principle of APFC Panel I

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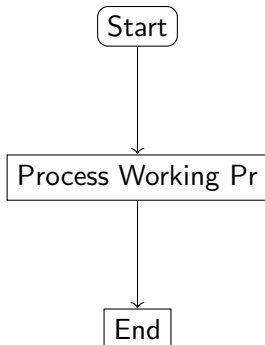
Working Principle of APFC Panel I

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Working Principle of APFC Panel I

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- Conclusion of the topic

Agenda I

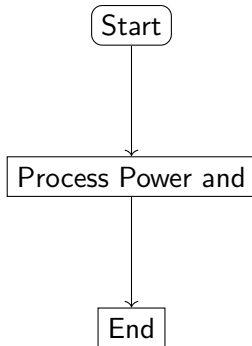
- Power and Control Wiring

Power and Control Wiring Definition

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- Important feature 1
- Important feature 2

Power and Control Wiring I



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Power and Control Wiring I

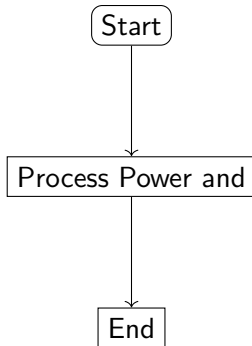
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Power and Control Wiring I

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- Detailed explanation step 1
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- Conclusion of the topic

Agenda I

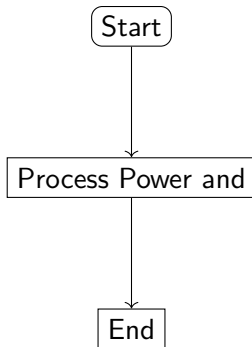
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Maintenance	Easy	Complex

Power and Control Wiring I

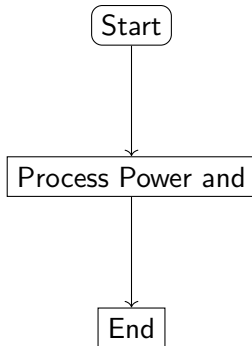
- Introduction to Power and Control Wiring
- Detailed explanation step 1
- Detailed explanation step 2
- Conclusion of the topic

Power and Control Wiring Definition

The key definition of Power and Control Wiring involves understanding its core principles.

- Important feature 1
- Important feature 2

Power and Control Wiring I



Power and Control Wiring I

Parameter	Type A	Type B
Cost	High	Low
Efficiency	Good	Moderate
Maintenance	Easy	Complex

Power and Control Wiring I

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