

Electric Power Distribution Systems II



EME410

Spring 21-22

Lecture 12



Uninterruptible Power Supply (U.P.S)

INSTRUCTOR

DR / AYMAN SOLIMAN

➤ Contents

- Introduction
- Specification of uninterruptible power supply
- Types of UPS
- How to selected UPS?
- UPS بعض الملاحظات فى توصيف
- Distortion harmonic



➤ Introduction

An **Uninterruptible Power Supply**, also **Uninterruptible Power Source**, **UPS** or **battery/flywheel backup**, is an electrical apparatus that provides emergency power to a load when the input power source, typically the utility mains, fails.

➤ Specification of uninterruptible power supply

1) types of ups

2) power(KVA)

3) time(min)

4) output harmonic distortion

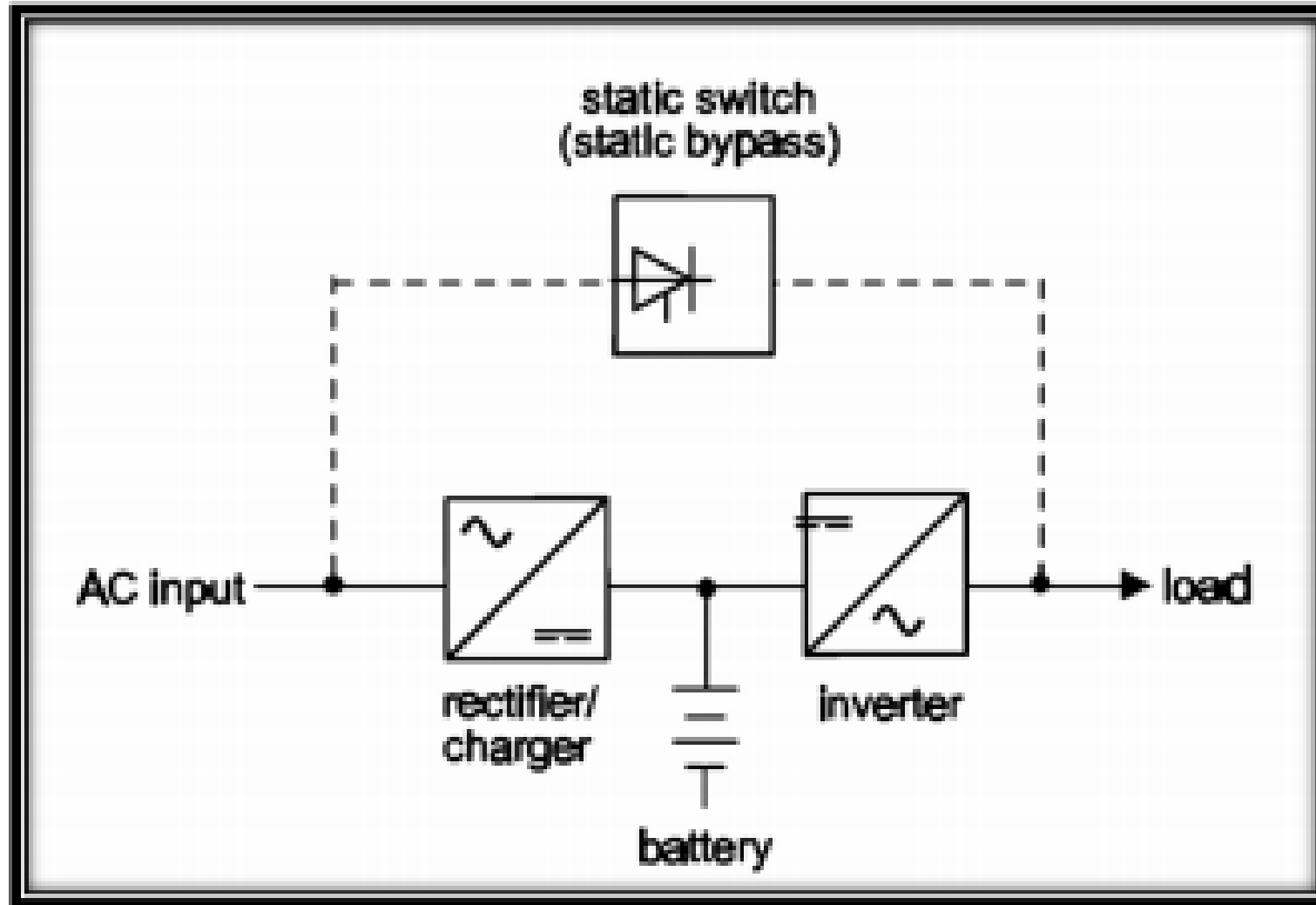
5) nominal output power factor



➤ **Types of UPS**

- ON-LINE U.P.S
- OFF-LINE U.P.S
- ONLINE UPS WITHN ISOLATING TRANSFORMER

➤ 1) ON-LINE U.P.S



➤ 1) ON-LINE U.P.S

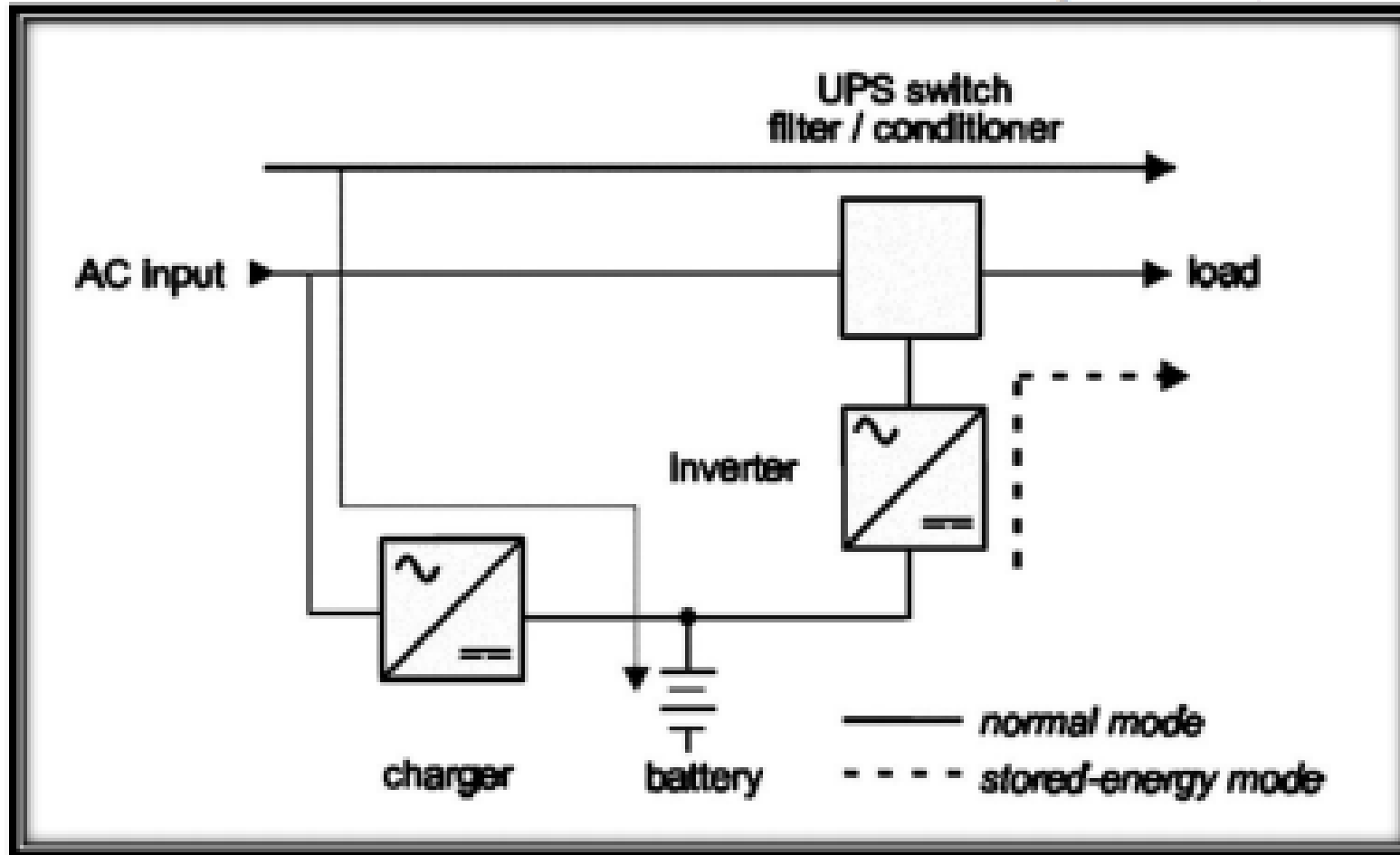
In this type of UPS, the system always remains on battery, whether mains ac is present or not.

When mains ac is present, it provides **power to DC supply** of inverter section as well as charges the battery simultaneously.

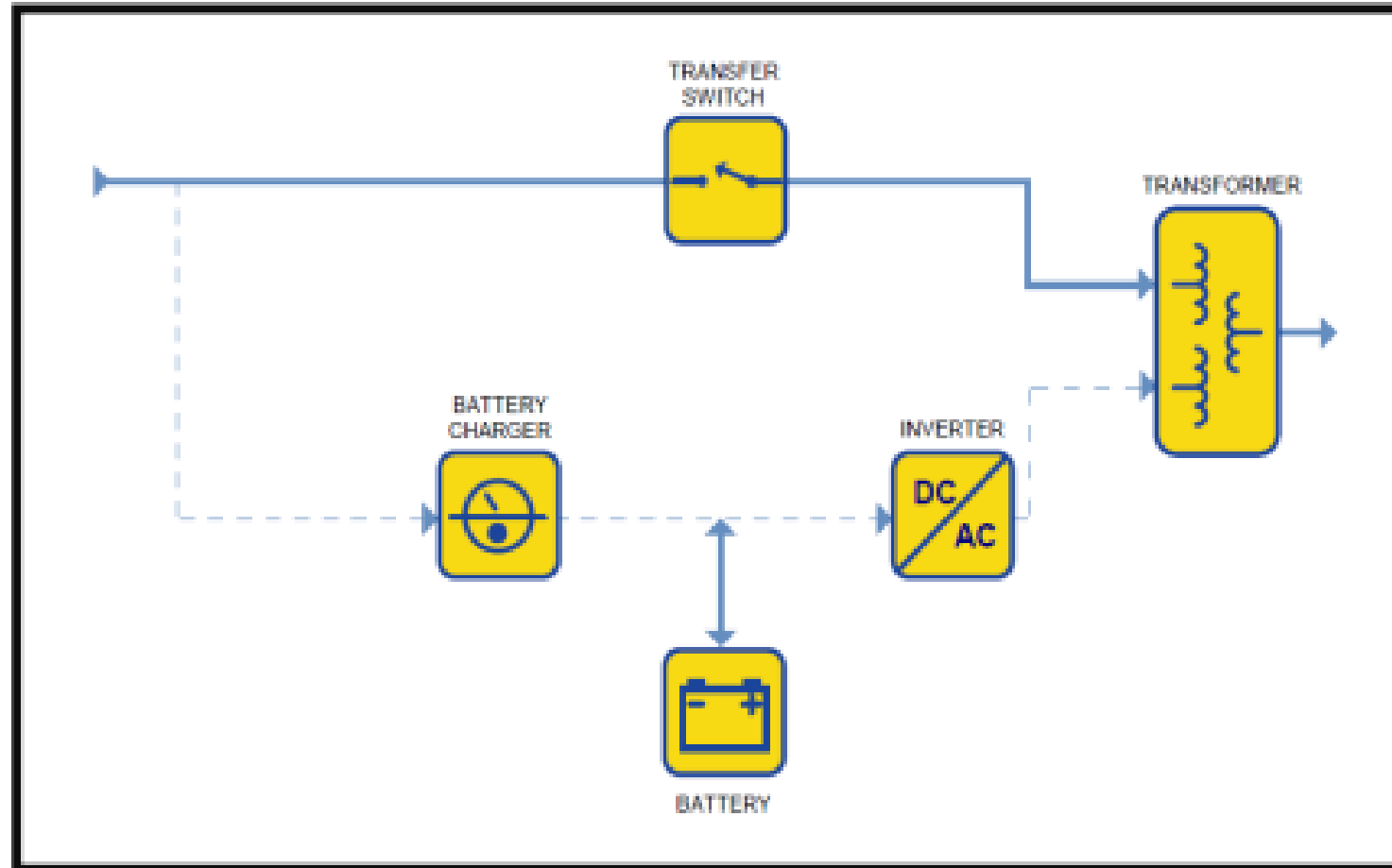
When mains ac is not present, it will run the connected load till the **battery has a recommended dischargeable level.**

➤ 2) OFF-LINE U.P.S

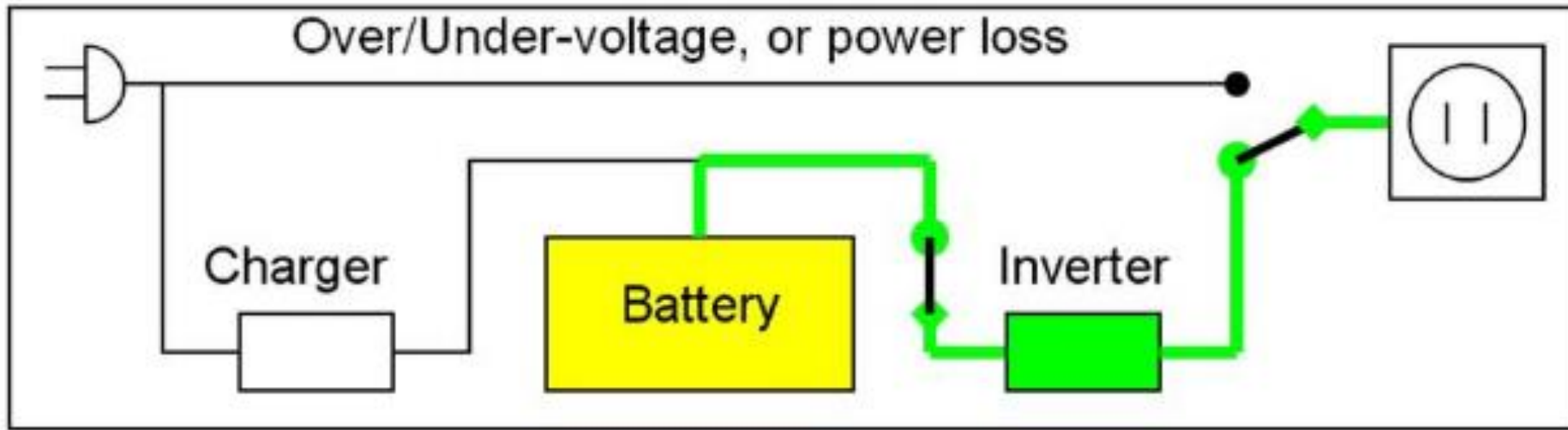
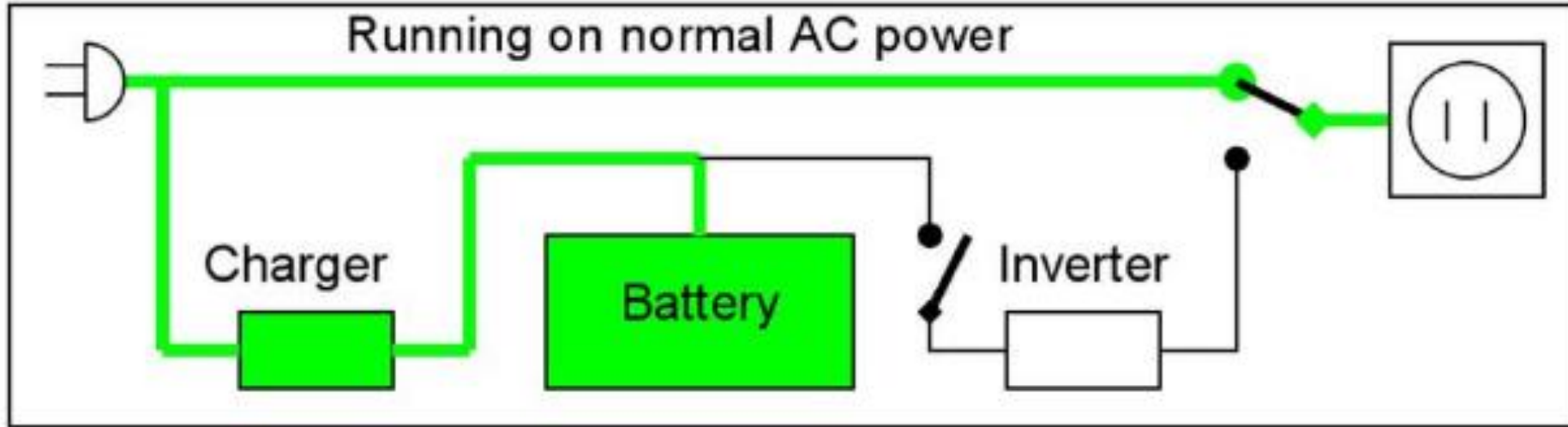
يفضل استخدام هذا النوع في الاحمال الاقل من ٢ ك ف أ



➤ 3) ONLINE UPS WITHN ISOLATING TRANSFORMER



يتم استخدام هذا النوع في احمال غرف العمليات والعناية المركز والافاقه



➤ **How to selected UPS?**

- For example, if you have the following loads:-

Computer load = 50 KVA

Operation Room load =100KVA

Total load of ups =160 KVA

So, Select UPS = 160 KVA

➤ بعض الملاحظات في توصيف UPS

- السعة : (ك.ف.أ)
- معامل قدرة (0.8)
- الجهد (دخول): 3 أوجه 220/380 فولت $\pm 10\%$ متردد او وجه واحد 220 فولت $\pm 10\%$ متردد.
- التردد(دخول): 50 ذ/ث $\pm 6\%$.
- الجهد (خروج): 3 أوجه 220/380 فولت $\pm 1\%$ (static load) ، $\pm 3\%$ عند تغيير الحمل ما بين 10% الى 100% من السعة الكاملة .
- التردد(خروج): 50 ذ/ث $\pm 1\%$.
- الموجه: Sine wave output.

➤ Distortion harmonic

- 1% or better at normal linear load
- $\pm 3\%$ at nonlinear load

● السعة الإضافية (Over load capacity) :- (120% لمدة 10 دقائق)

● درجة حرارة التشغيل :- من 5 - 40 °م

➤ **Specification**

➤ The

Thank
you

