Design Exploration
在大型商用空调机组减震器位置优化中的应用

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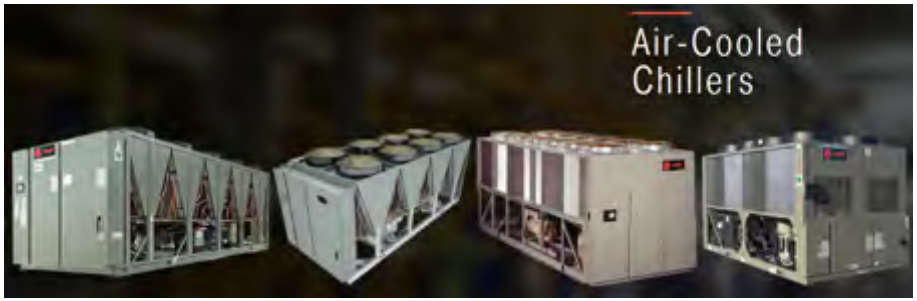
Contents

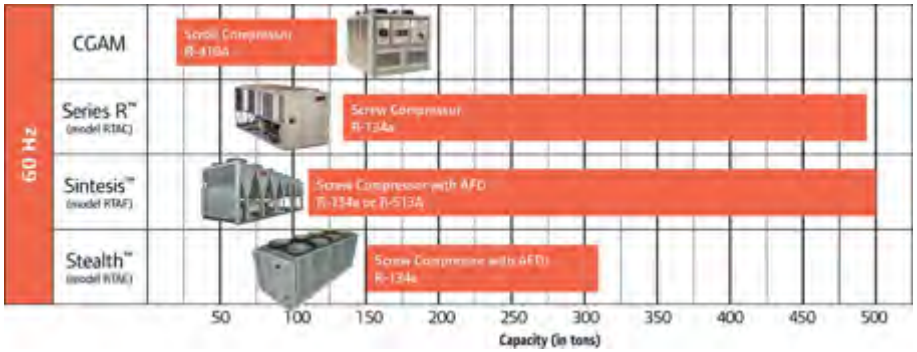
- **Company & Product introduction 公司及产品介绍**
- **Background & problem 背景及问题**
- **Application of Design Exploration DX的应用**
  - ✓ What is Design Exploration?
  - ✓ ANSYS Design Exploration Introduction
  - ✓ Design Exploration in Isolator Location Optimization
    - Define optimization: Design parameter, Constraints, Objective
    - Results plot
- **Summary & Action in next 总结及展望**

英格索兰亚太研发中心

- **Ingersoll Rand**
  - 1871年成立, 1922年进入中国上海;
  - 多元化的工业制造企业，其旗下品牌Trane, Thermo King, IR, Club Car.
- **ETC-AP**
  - 400工程师，英格索兰全球最大工程技术中心；
  - 研发能力基于暖通设备，向工业设备扩展.

Product Introduction - Air-cooled Chiller





机组安装在楼顶上

主要用于商场，医院，酒店, 工厂，数据中心

Background and problem

What is Design Exploration?

What is Design Exploration?

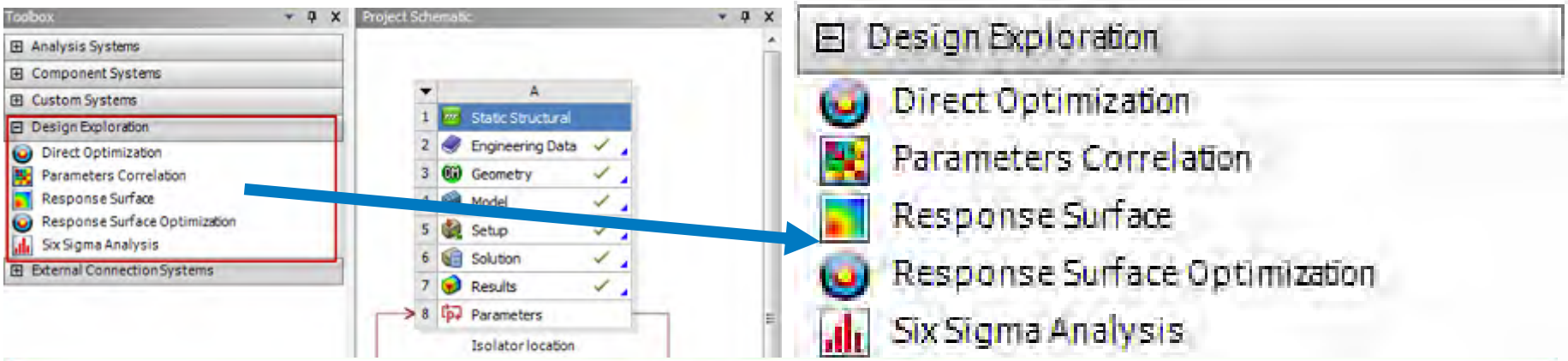
- Wh

Design Exploration is a powerful approach used by DesignXplorer for designing and understanding the analysis

ANSYS design exploration tools lead the way to Simulation-Driven Product Development.

Harness the power of parametric analysis to increase innovation and improve the return on your simulation investment.

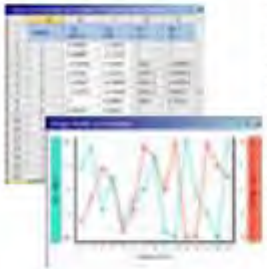
ANSYS Design Exploration



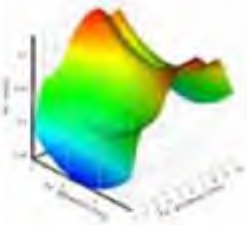
ANSYS Design Exploration

Parameterized CAD

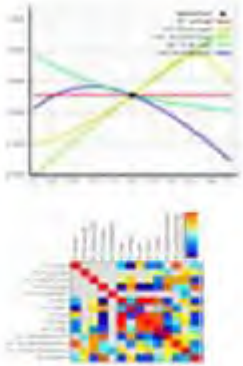
Design of Experiments



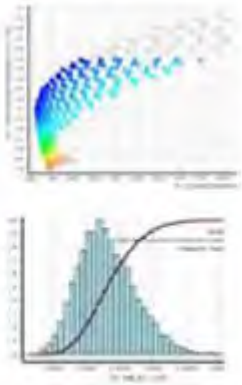
Response Surface Methods



Sensitivity/ Correlation Analysis



Optimization/ Robust Design/ Six Simga



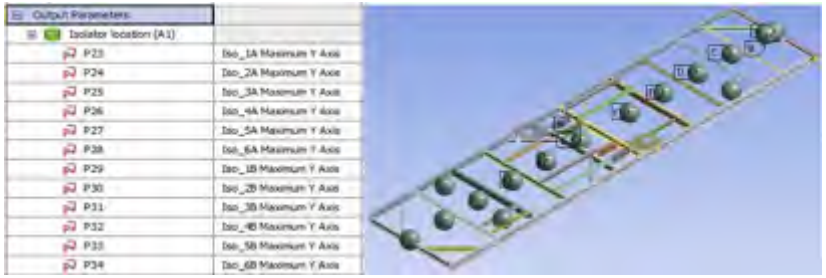
Report Generation

Application of Design Exploration

- Parameterize analysis model

Input Parameters	
Isolator location (A1)	
P13	Iso_1
P14	Iso_2
P15	Iso_3
P16	Iso_4
P17	Iso_5
P18	Iso_6

Input parameter



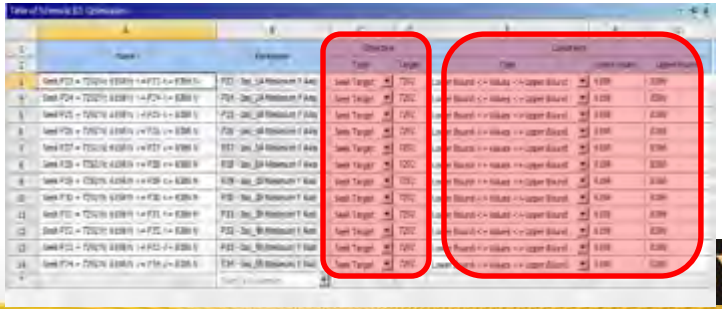
Output parameter

- Define optimization
  - Objective
  - Constraints
  - Domain

Input Parameters		
Name	Lower Bound	Upper Bound
P13 - Iso_1 (mm)	700	945
P14 - Iso_2 (mm)	1300	3000
P15 - Iso_3 (mm)	3000	4200
P16 - Iso_4 (mm)	4200	5245
P17 - Iso_5 (mm)	5545	7945
P18 - Iso_6 (mm)	8150	9300

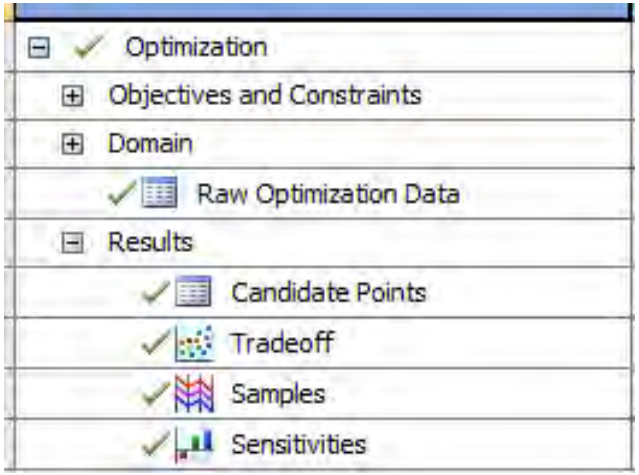
Outline of Schematic B2: Optimization

	A	B	C
1		Enabled	Monitoring
2	Optimization		
3	Objectives and Constraints		
16	Domain		
29	Raw Optimization Data		
30	Results		



Application of Design Exploration

- **Optimization results**

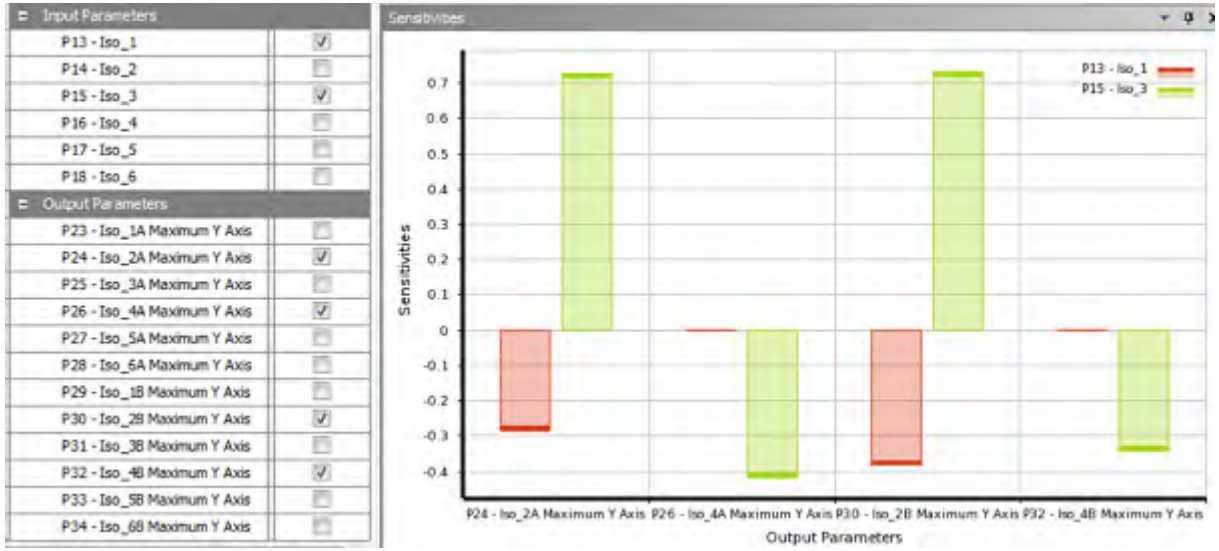


Candidate Points

Table of Schematic B2: Optimization, Candidate Points

	A	B	C	D	E	F	G	H
1	Reference	Name	P13 - Iso_1 (mm)	P14 - Iso_2 (mm)	P15 - Iso_3 (mm)	P16 - Iso_4 (mm)	P17 - Iso_5 (mm)	P18 - Iso_6 (mm)
2								
3	◉	Candidate Point 1 DP 236	927.5	2654.6	3803.5	5162	6584.7	8221.4

Sensitives chart



Summary & Action

- **Application of Design Exploration**

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Line weight location optimization

Line design optimization

感谢聆听