

The logo for AVEVA, featuring the word "AVEVA" in a bold, blue, sans-serif font. The letter "E" is stylized as three horizontal bars. A small "TM" trademark symbol is located to the upper right of the final "A".

AVEVATM



PDMS设备建模

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AVEVA中国
2007.5.7

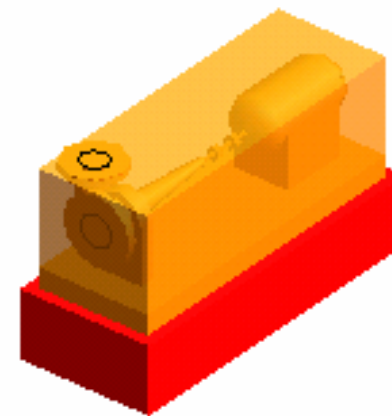
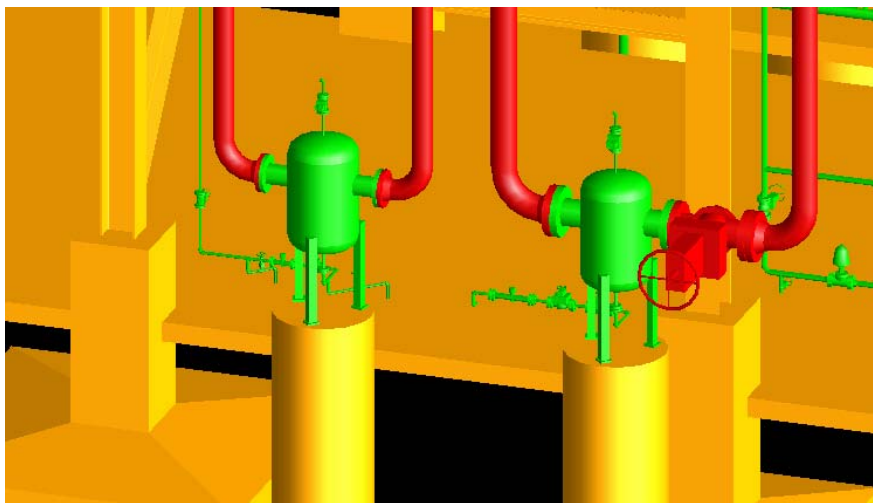


设备模型应用



▼ 设备模型的应用

- 空间占位，包括维修空间
- 管道连接
- 与结构相关：结构基础，楼板开孔，楼板支撑

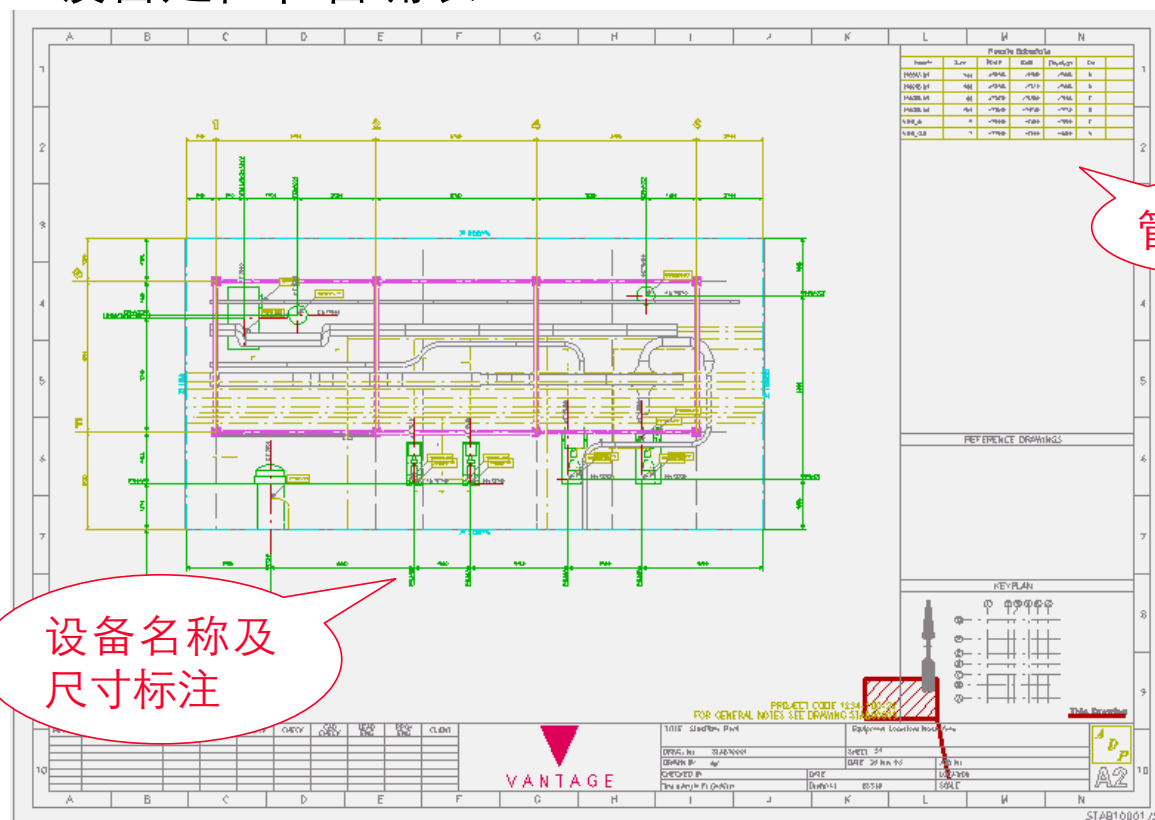


VANTAGE Plant Design

设备平面布置图



▼ 设备定位和管嘴表



管嘴表

设备名称及
尺寸标注

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课程主要内容



- ▼ 设备的构成
- ▼ 设备的生成方法
- ▼ 设备定位方法

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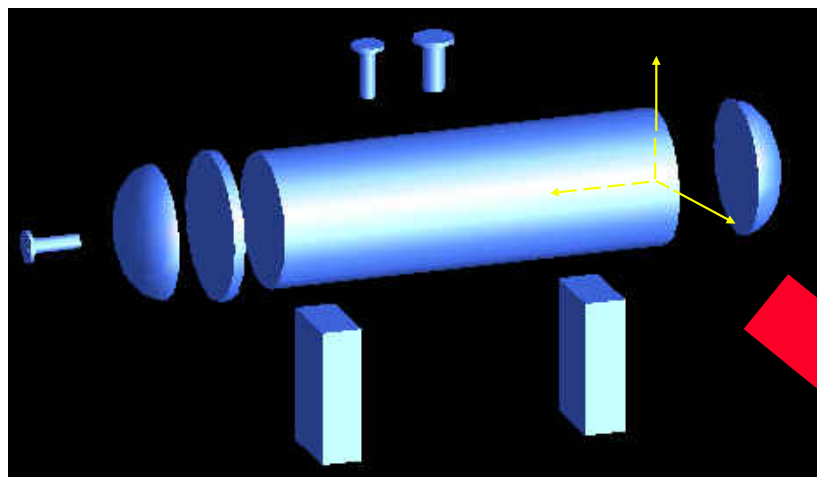
设备的构成



设备构成



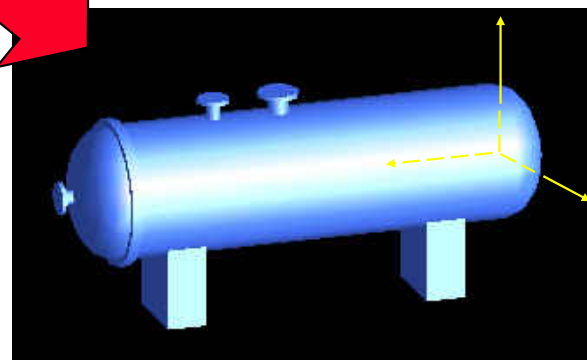
设备定位点Origin



▼ 设备是由多个基本体
Primitive拼装起来的

▼ 基本体参考(Wrt)设备定位点
生成和定位

设备定位点

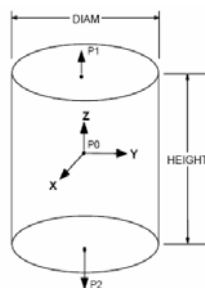


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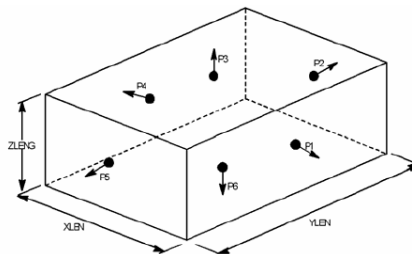
PDMS提供了多种基本体



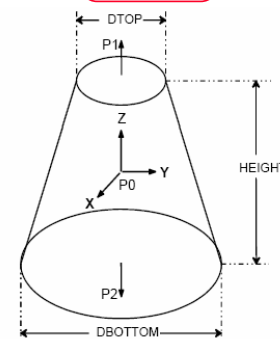
圆柱
Cylinder



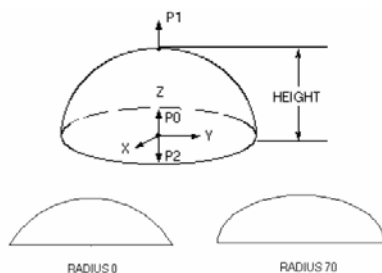
矩形
Box



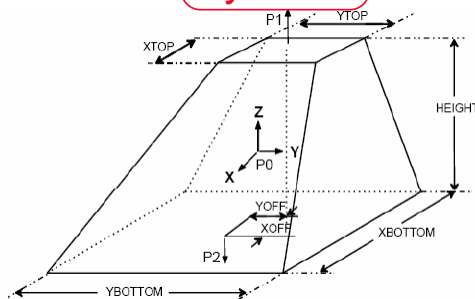
圆台
Cone



圆盘
Dish



偏心圆台
Pyramid



偏心圆台
Snout

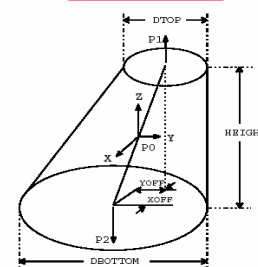


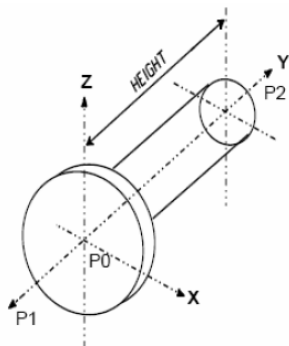
Figure 5-9 The SNOOT Element

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特殊基本体



管嘴
Nozzle



拉伸体
Extrusion

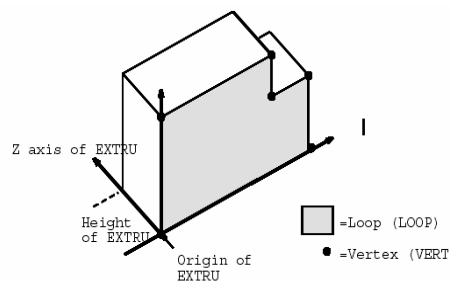


Figure 5-15 Defining an EXTRUtion

旋转体
Revolution

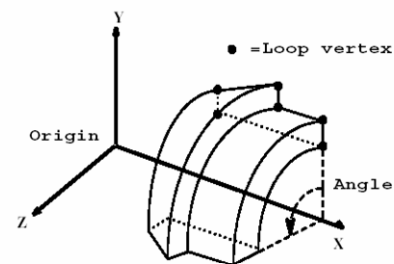


Figure 5-16 Defining a Solid of REVolution

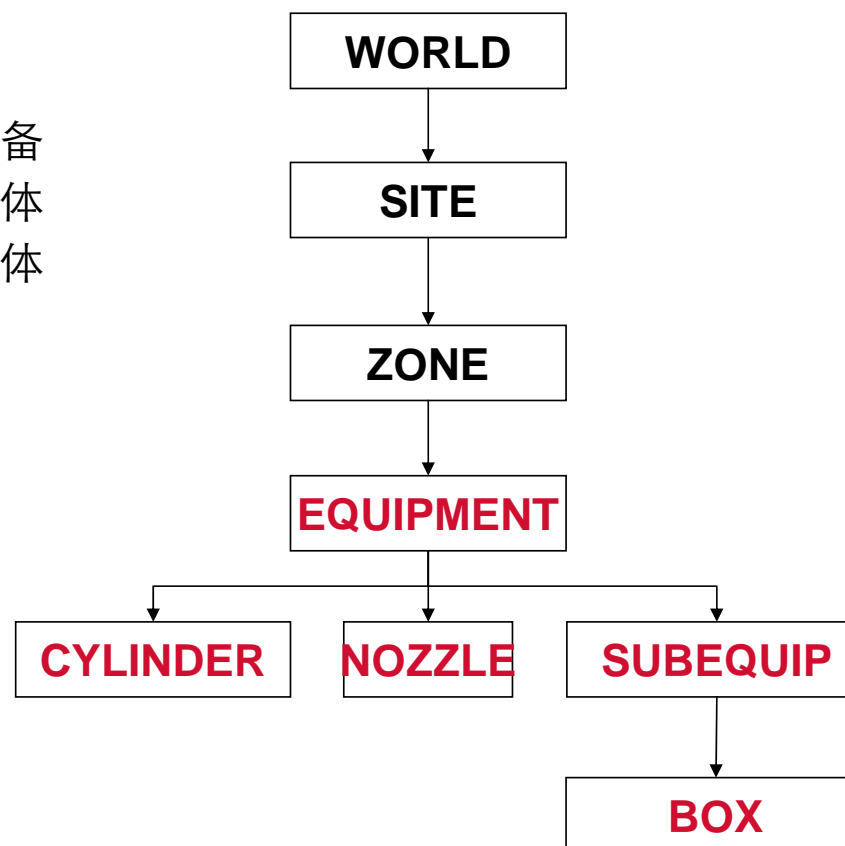
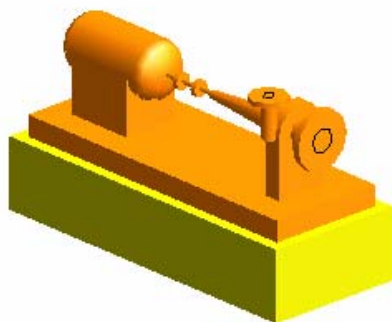
VANTAGE Plant Design

数据库层次(database hierarchy)



▼ 设备数据库的层次

- EQUIPMENT 设备
- SUBEQUIP 子设备
- CYLINDER 圆柱体
- BOX 长方体
- Nozzle 管嘴



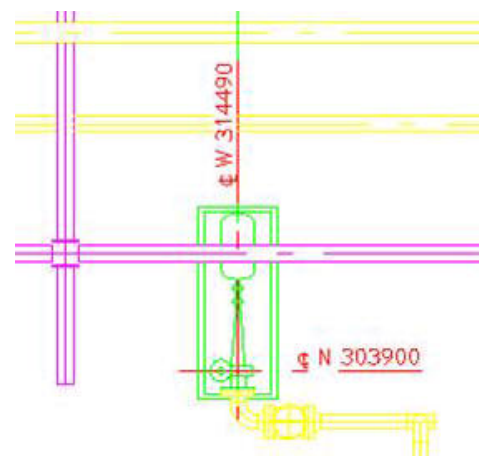
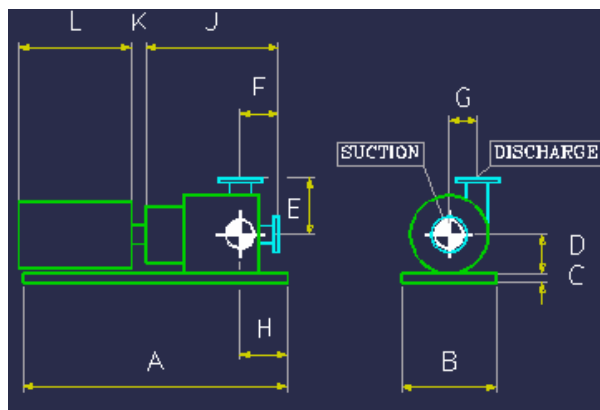
VANTAGE Plant Design

设备定位点



▼ 设备定位点的作用

- 设备定位
- 平面图中标准设备定位点
- 基本体参考设备定位点生成和定位

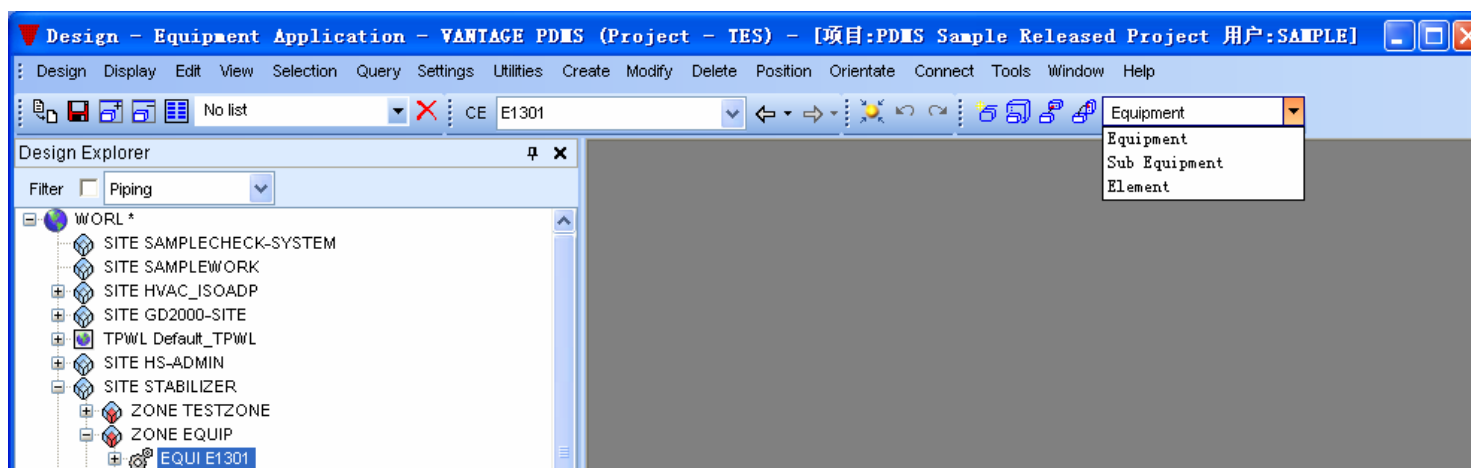


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进入设备模块



- ▼ 进入设备模块
 - Design>Equipment...

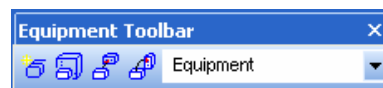


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设备工具栏



- ▼ 数据库层次控制缺省是Equipment
 - 进行基本体操作时选择Element



VANTAGE Plant Design



设备的生成方法



设备的生成方法



- ▼ 基本设备模板(Basic Equipment template)
- ▼ 参数化设备模板(Parametric Equipment template)
- ▼ 搭积木方式(Primitive)
- ▼ 读取宏文件(Input Macro file)
- ▼ 软件接口
 - 通过Implant-I接口导入Dgn模型
 - 通过Implant-stl接口导入模型

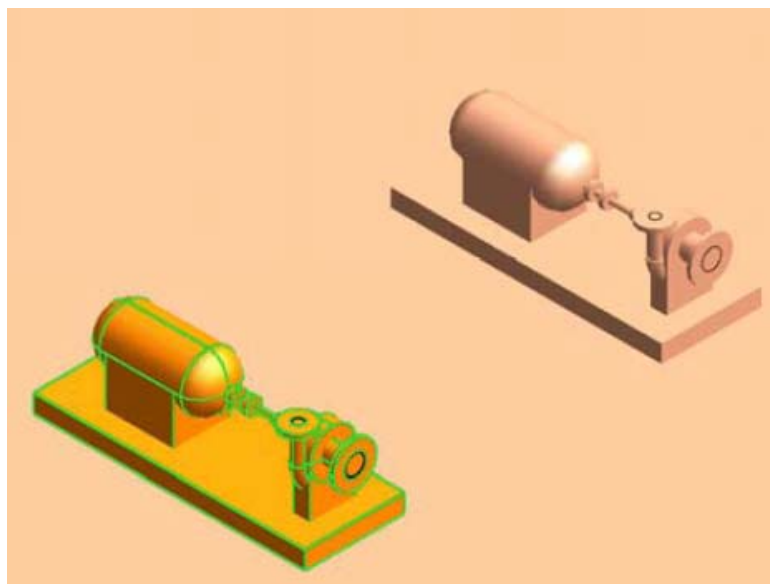
VANTAGE Plant Design

练习一:基本设备模板生成泵P1501A



▼ 练习重点

- 了解基本设备模板
- 设备命名, 管嘴命名
- 设备定位及方向
- 管嘴等级
- 设备尺寸



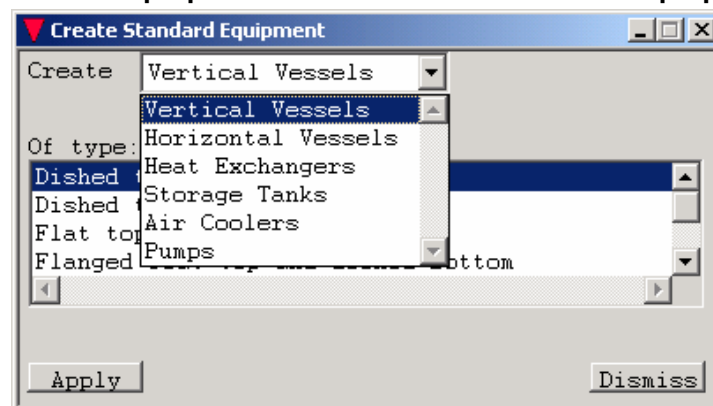
VANTAGE Plant Design

基本设备模板



▼ 参数不能通过界面修改

- Utilities>Equipment>Create>Basic Equipment



▼ 包含6大类设备

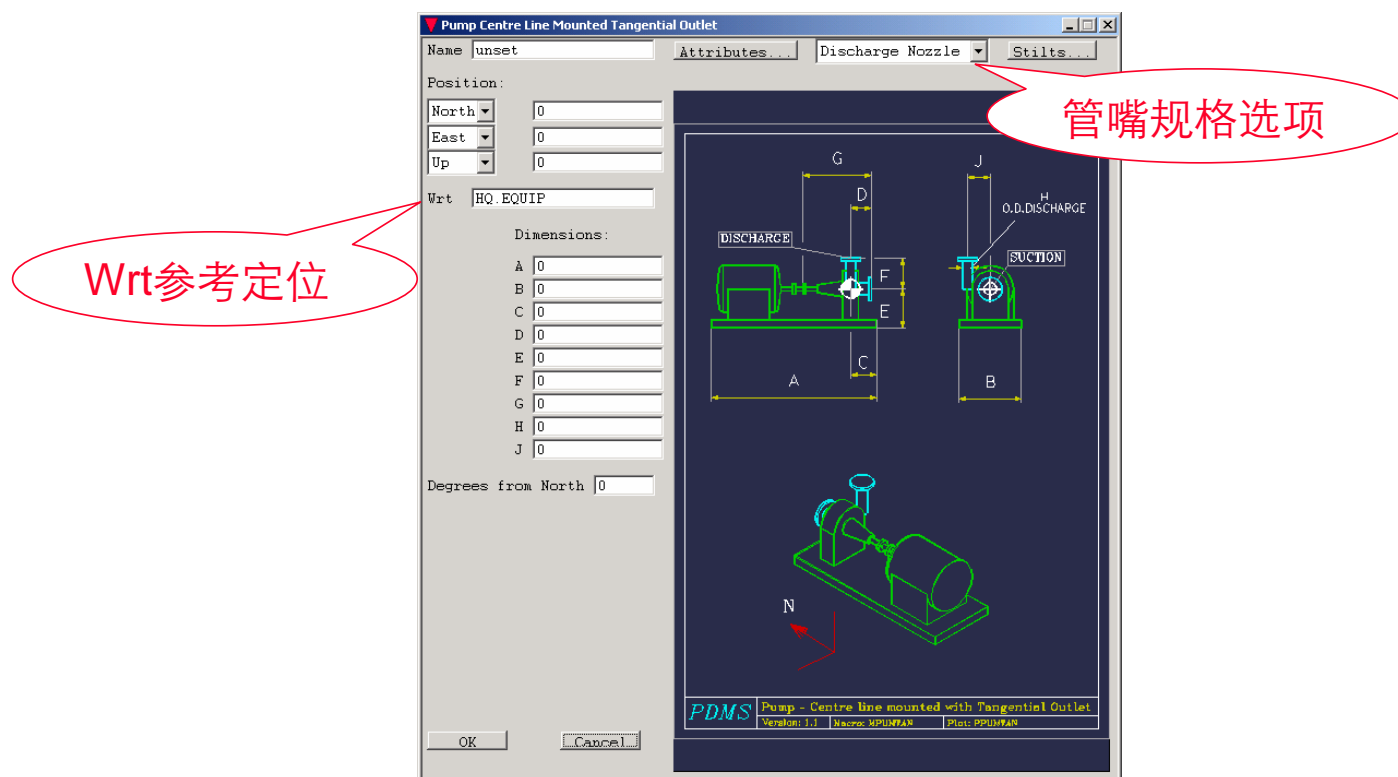
- 立式设备,卧式设备,管壳式换热器
- 储罐,空冷,泵

VANTAGE Plant Design

模板选项



- ▼ 模板中定义名称,定位点,参数,设备方向,管嘴和基础



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管嘴等级



▼ 管嘴规格选项

A screenshot of a software dialog box titled "Nozzle Specification". It contains several input fields and buttons. The "CE" dropdown is set to "CE". The "Specification" field is set to "300# R.F.". The "Generic Type" dropdown is set to "ANSI FLANGED". The "Nominal Bore" dropdown is set to "100". The "SpecRef" field is set to "/300#RF/AZFBD0NN". There are "Apply" and "Dismiss" buttons at the bottom.

Nozzle Specification

CE Select Nozzle - Suction

Specification : 300# R.F.

Generic Type : ANSI FLANGED

Nominal Bore : 100

SpecRef : /300#RF/AZFBD0NN

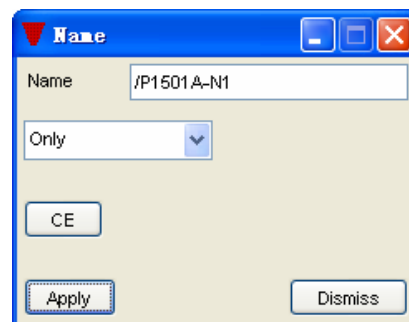
Apply Dismiss

VANTAGE Plant Design

管嘴命名



- ▼ 管嘴命名格式
 - 设备名-管嘴名 /P1501A-N1
- ▼ 修改命名
 - Modify>Name



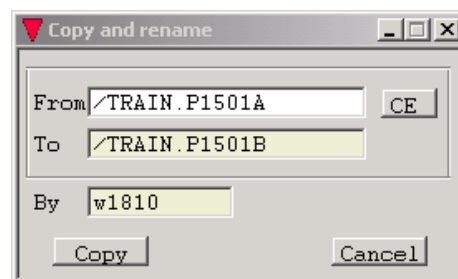
VANTAGE Plant Design

练习二：拷贝生成泵P1501B



▼ 练习重点

- 拷贝与重命名



VANTAGE Plant Design

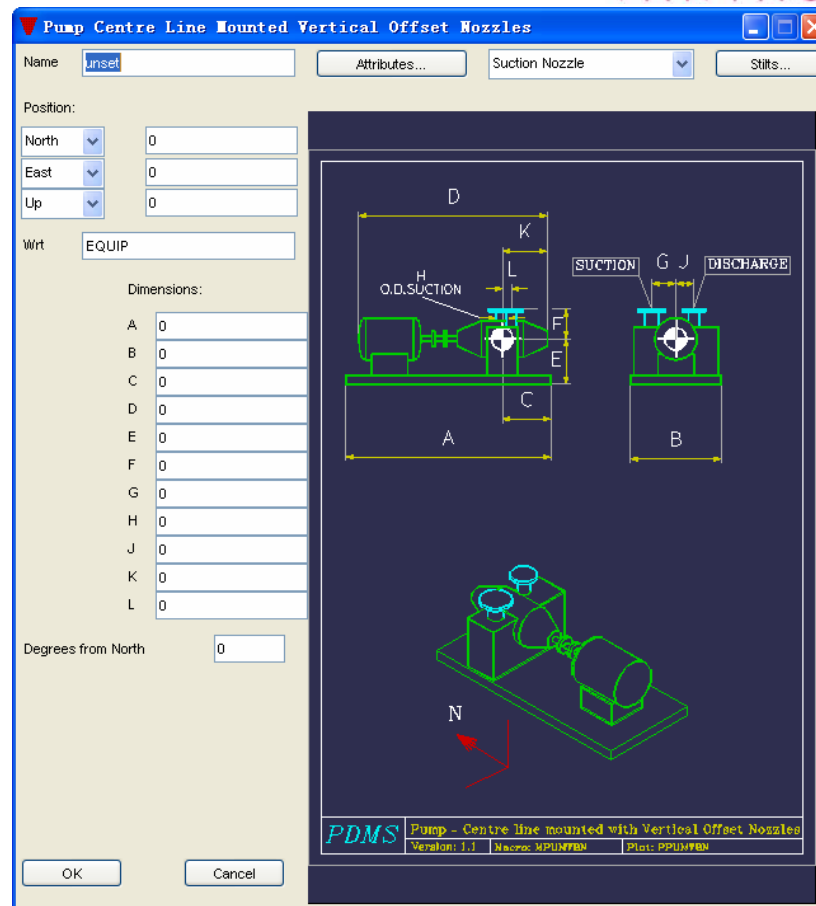
练习三：基本设备模板生成泵P1502A



VANTAGE

▼ 练习重点

- 不同的设备模板
- 设备定位点修改



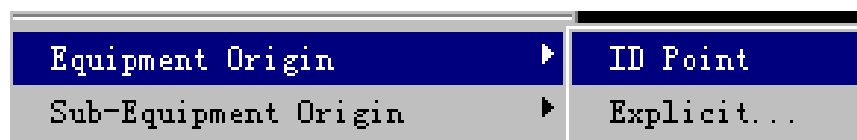
VANTAGE Plant Design

设备定位点修改



▼ 修改设备定位点，不会移动设备

- Modify>Equipment origin>ID Ppoint,选择一个Ppoint作为设备的新定位点



- Modify>Equipment origin>Explicity,用相对定位修改设备定位点

练习四：拷贝生成泵P1502B



- ▼ 练习重点
 - 拷贝与重命名

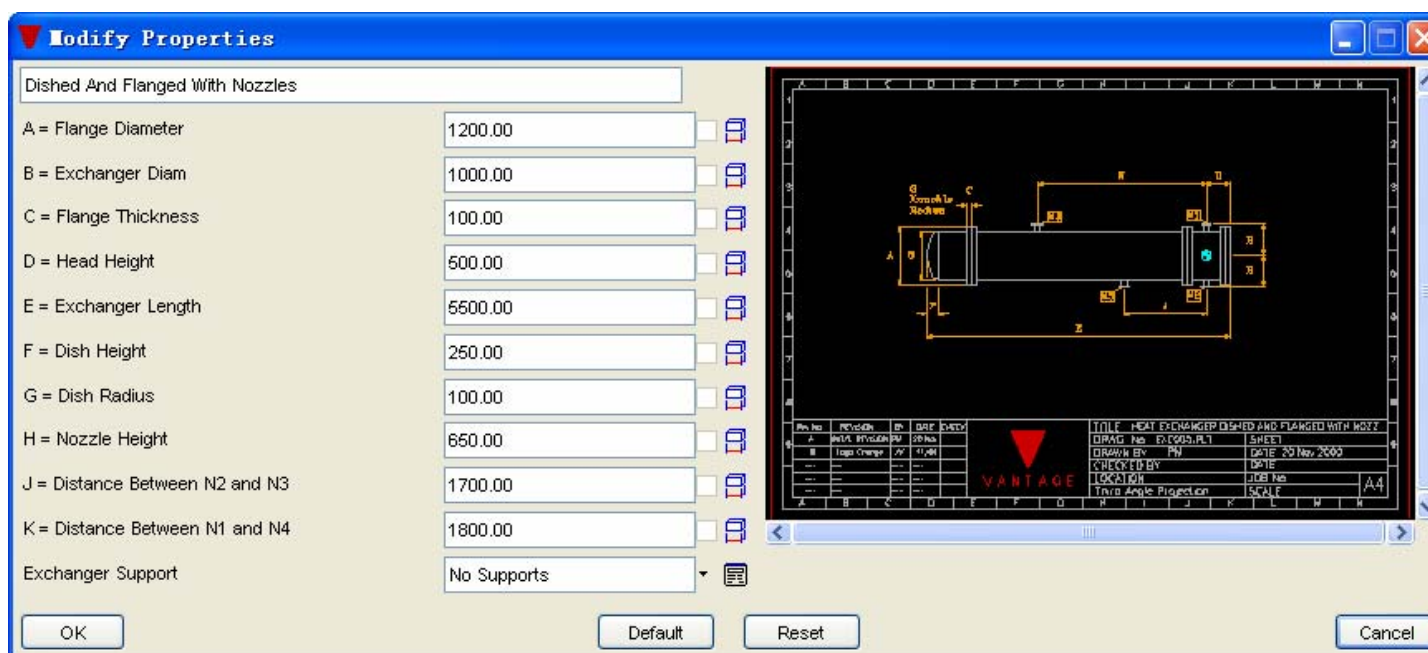
VANTAGE Plant Design

练习五：参数化设备模板生成E-1302A



▼ 练习重点

- 了解参数化设备模板

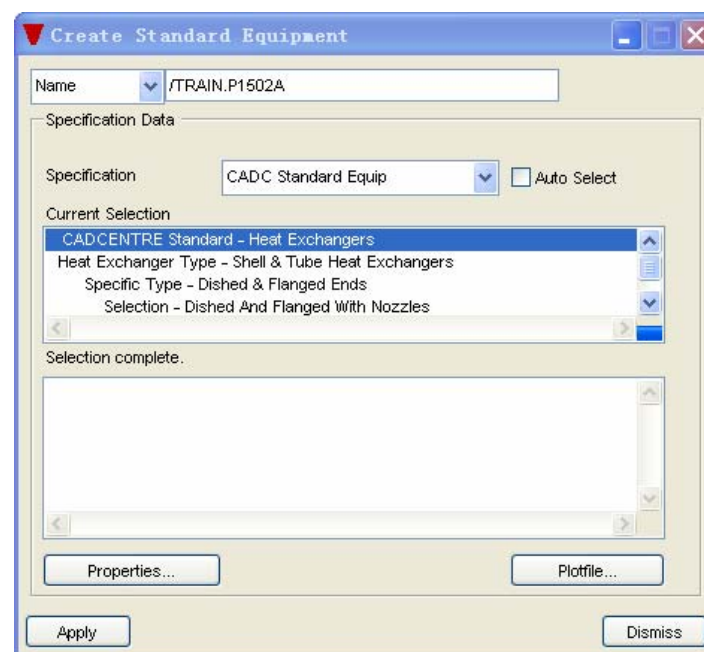
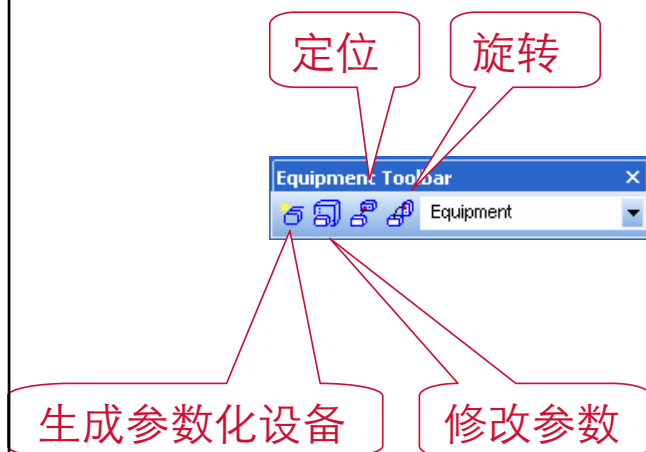


VANTAGE Plant Design

参数化设备模板



▼ 参数可以修改,相关参数自动变化

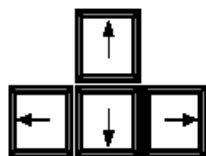


VANTAGE Plant Design

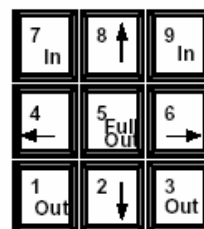
模板视图缩放



▼ 模板视图缩放



Arrow keys pan in directions shown



Numeric Keypad keys 2, 4, 6, 8 pan in directions shown by half view width.

Keys 7 and 9 zoom in

Keys 1 and 3 zoom out

Key 5 zooms out to the sheet limits

VANTAGE Plant Design

修改设备管嘴等级



- ▼ 修改设备管嘴等级
 - Modify>Nozzle Specification

A screenshot of the "Nozzle Specification" dialog box. The title bar is blue with the text "Nozzle Specification" and standard window controls. The dialog has a light beige background. At the top left, there is a dropdown menu showing "CE" and a label "Select Nozzle - Suction". Below this are four rows of input fields: "Specification :" with a text box containing "300# R.F." and a dropdown arrow; "Generic Type :" with a text box containing "ANSI FLANGED" and a dropdown arrow; "Nominal Bore :" with a text box containing "100" and a dropdown arrow; and "SpecRef :" with a text box containing "/300#RF/AZFBD0NN". At the bottom left is an "Apply" button, and at the bottom right is a "Dismiss" button.

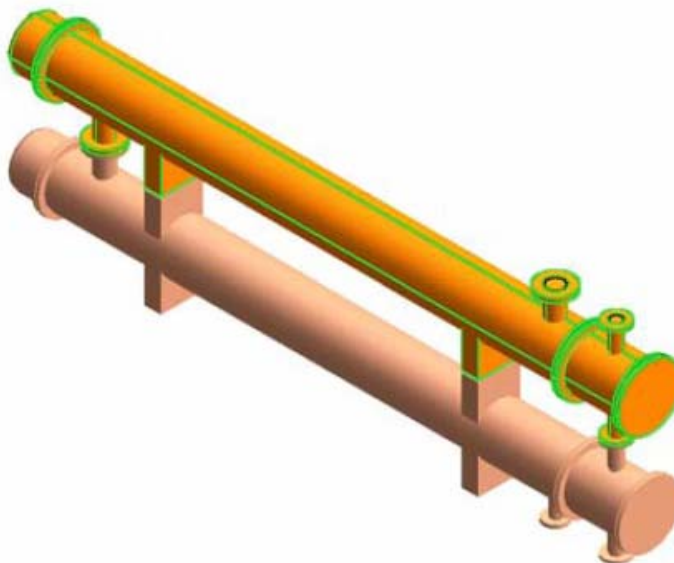
VANTAGE Plant Design

练习六：生成E1302B



▼ 练习重点

- 拷贝与重命名
- 修改参数化设备



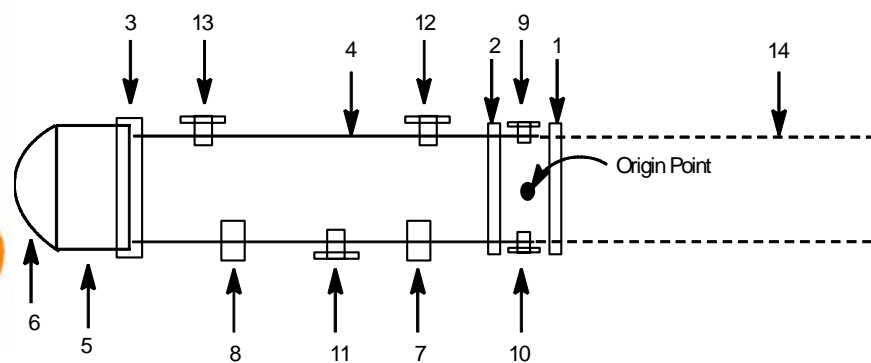
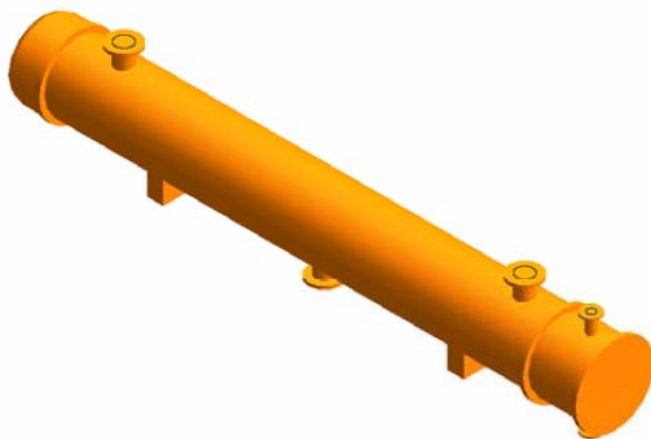
VANTAGE Plant Design

练习七：搭积木方式生成E1301



▼ 练习重点

- 建立设备管理层
- 使用基本体
- 基本体定位方法



VANTAGE Plant Design

建立设备管理层



- ▼ 建立设备管理层
 - Create>Equipment

A screenshot of the "Equipment Crea..." dialog box. It has a title bar with a red triangle icon and standard window controls. The "Name" field contains "/TRAIN.E1301". The "Position:" section has three rows: "North" with a dropdown arrow and a value of "0", "East" with a dropdown arrow and a value of "0", and "Up" with a dropdown arrow and a value of "0". The "Wrt" field contains "EQUIP". There is an "Attributes..." button, and "OK" and "Cancel" buttons at the bottom.

Equipment Crea...

Name: /TRAIN.E1301

Position:

North	0
East	0
Up	0

Wrt: EQUIP

Attributes...

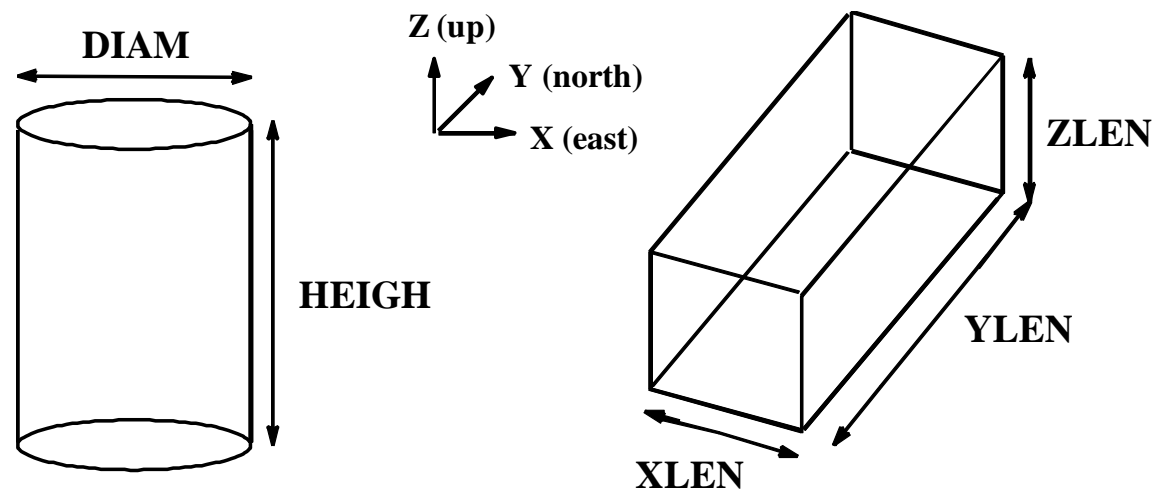
OK Cancel

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基本体属性



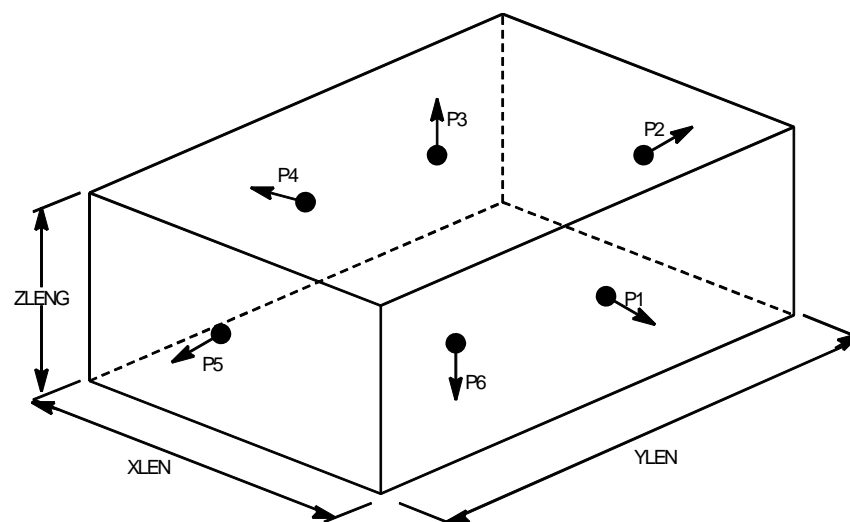
▼ 实体类型(Type)不同, 属性(Attribute)不完全一样



Ppoint点



- ▼ 基本体每一个面的中心都有一个指向外面的关键点-Ppoint点
 - P0是基本体的定位点，其他依次是各个面上的点
 - Ppoint点可以用于确定基本体面的位置及基本体之间的连接



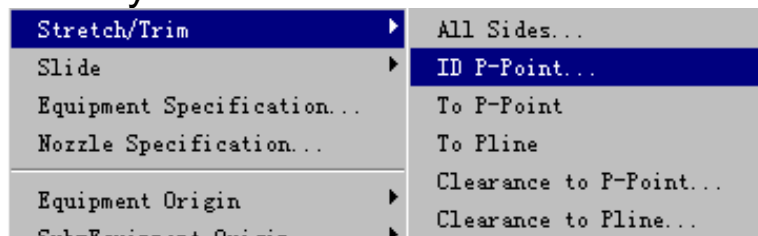
VANTAGE Plant Design

基本体拉伸与剪切



▼ 拉伸与剪切

— Modify>stretch/trim



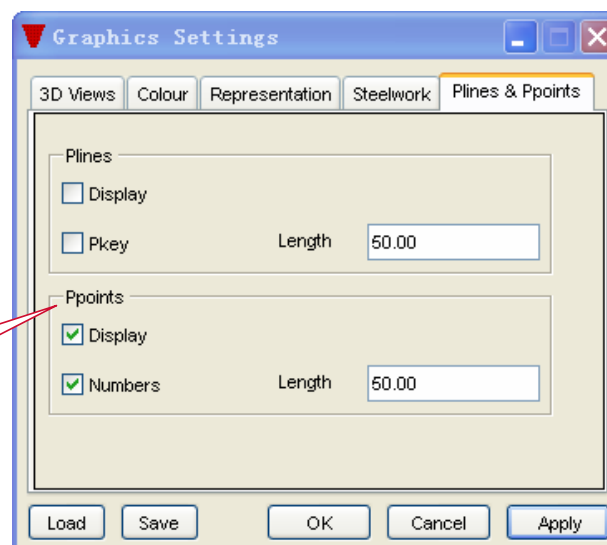
- All Sides 所有面都变化
- ID P-Point 选择的面改变
- To P-Point 选择的面延伸到另外的面上

显示Ppoint点



▼ 显示Ppoint点

— Setting>Graphics>Representation



Ppoint点设置

VANTAGE Plant Design

通过Ppoint点连接基本体



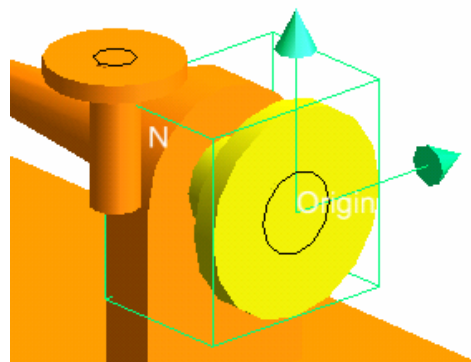
- ▼ 连接Ppoint点的方法
 - Connect>Primitive>ID point
 - 根据提示分别选择两个基本体的Ppoint点

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管嘴定位方法



- ▼ 设备管嘴在PDMS中作为基本体出现
 - Create >Primitive>Nozzle
 - 管嘴法兰面中心是定位点(P1点)，方向向外

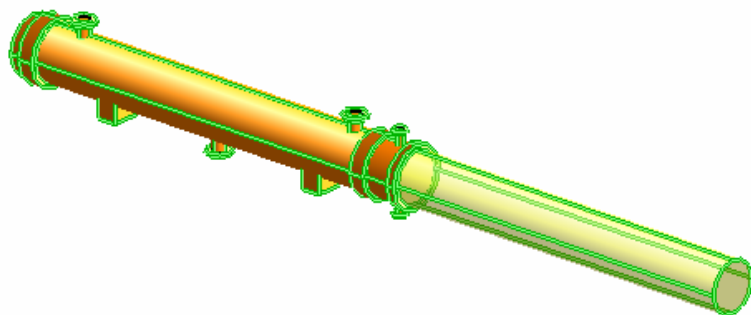


VANTAGE Plant Design

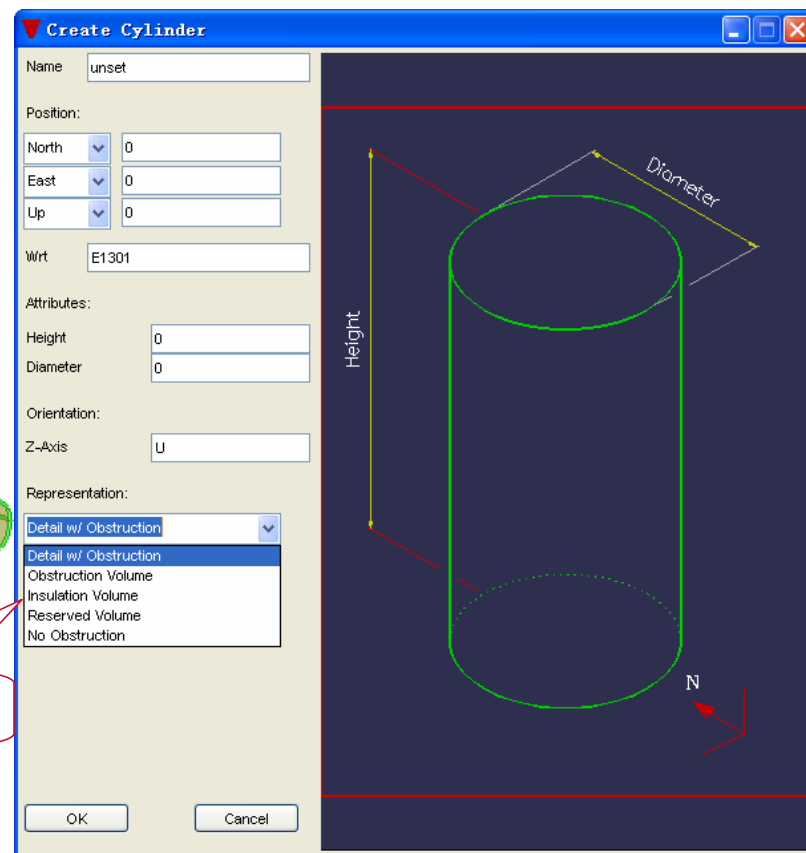
设备保护空间



▼ 用于碰撞检查和设备检修



保护空间设置



VANTAGE Plant Design

层与显示控制



▼ PDMS预定义10个层

- 本体 0-10层
- 保温空间 7-10层
- 预留空间 8-10层
- 碰撞空间 9-10层

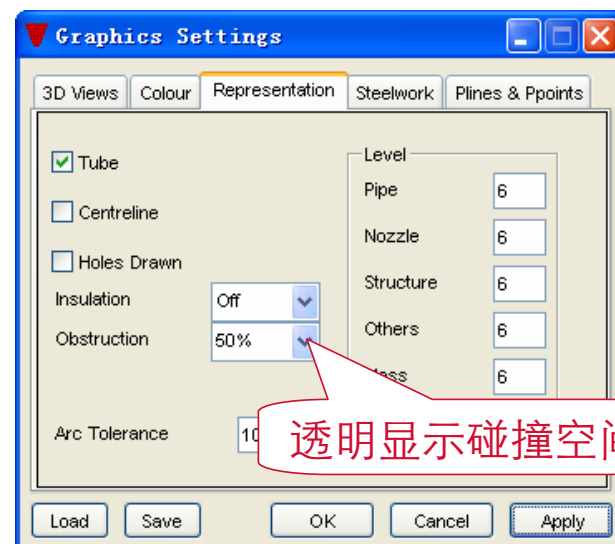
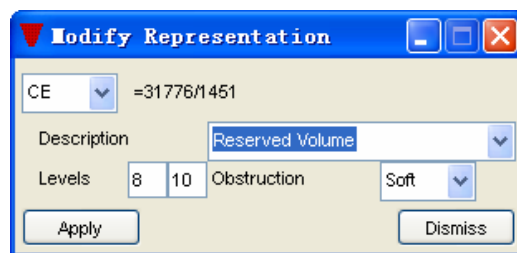
Obst=0

Obst=1

Obst=1

Obst=2

设计显示中
没有区分



VANTAGE Plant Design

练习八：用基本模板生成C1101



- ▼ 练习重点
 - 偏移管嘴的定位

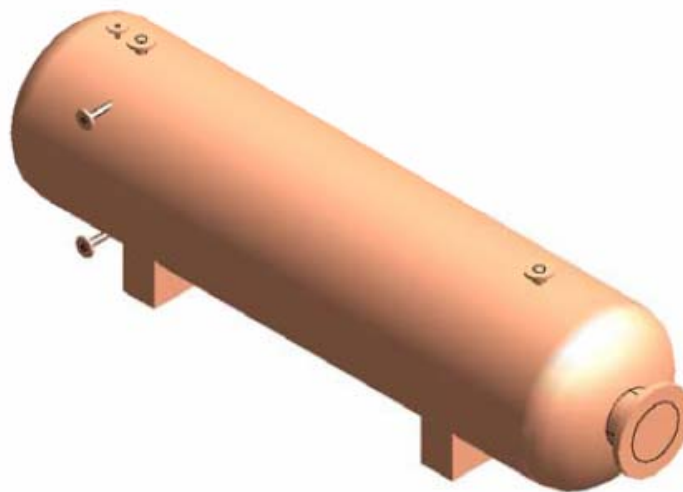


VANTAGE Plant Design

练习九：用宏文件生成D1201



- ▼ 练习重点
 - 宏文件导入导出

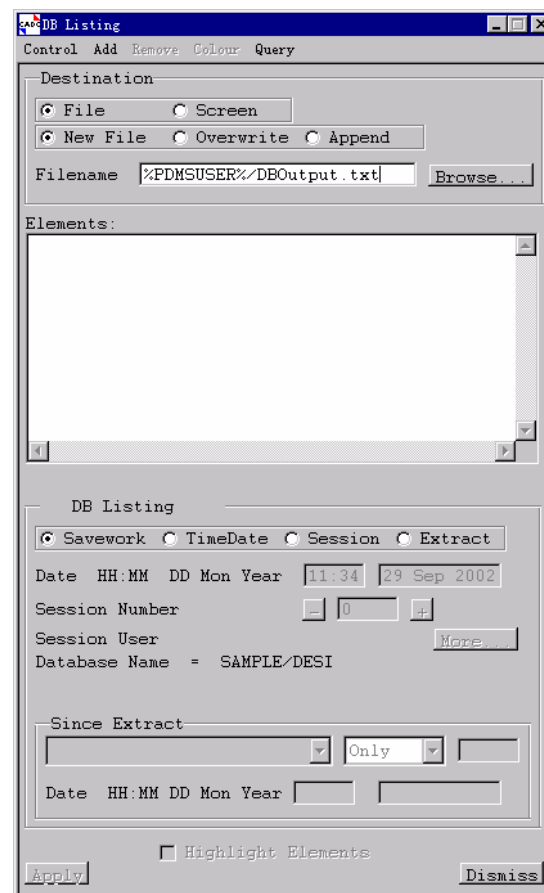
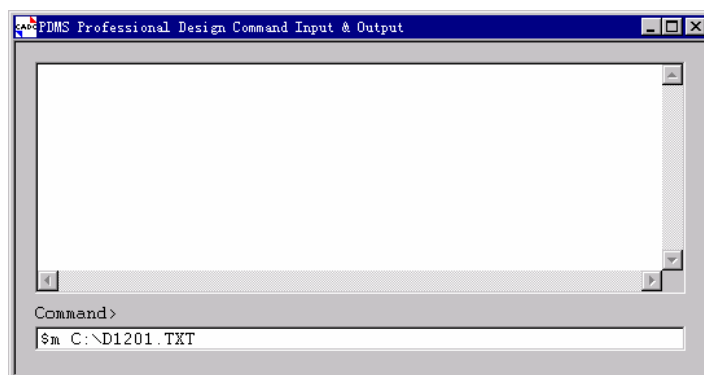


VANTAGE Plant Design

宏文件导入导出



- ▼ 生成宏文件
 - Utilities>DB Listing
- ▼ 读取宏文件
 - 命名行\$m



VANTAGE Plant Design

DB Listing



▼ 注意事项

- 输出路径
- 相对路径
- 文件追加

A screenshot of a "Destination" dialog box. It contains two rows of radio buttons. The first row has "File" (selected) and "Screen". The second row has "New File" (selected), "Overwrite", and "Append". Below these is a "Filename" label followed by a text box containing "%PDMSUSER%/DBOutput.txt" and a "Browse..." button.

Destination

☒ File ☐ Screen

☒ New File ☐ Overwrite ☐ Append

Filename

VANTAGE Plant Design



设备的定位方法



相对定位(Wrt)



▼ Wrt=With Respect to关于
Equipment Origin

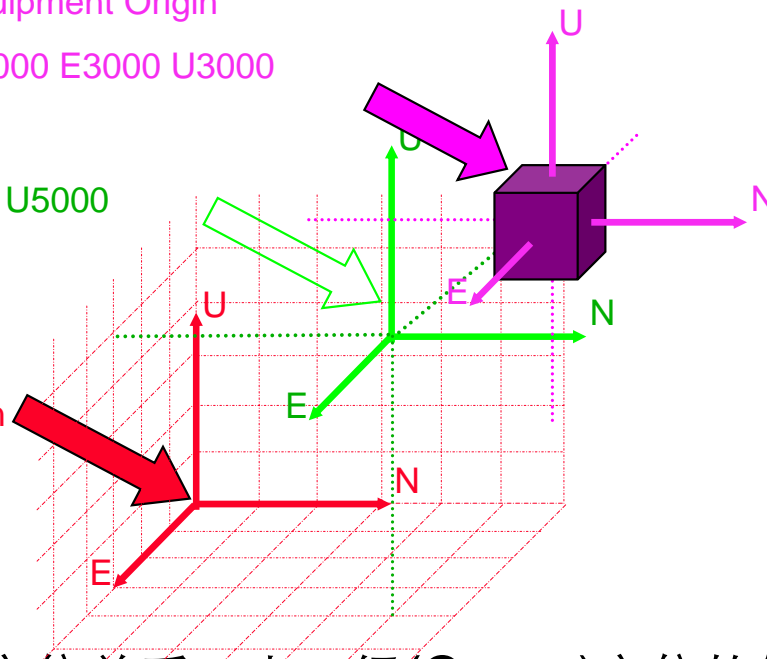
N4000 E3000 U3000

Site Origin

N5000 E4000 U5000

World Origin

N0 E0 U0



▼ 注意：因为相对定位关系，上一级(Owner)定位的修改都会带动所有成员位置的变化，整体移动

VANTAGE Plant Design

坐标系

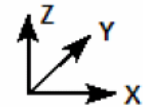


▼ 转换坐标系

Position wrt World

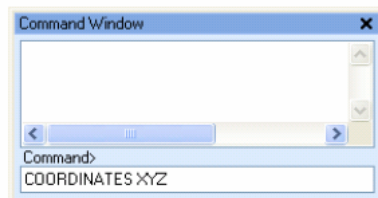
This is the position with respect to the world i.e. absolute co-ordinates, in VANTAGE each element has a default orientation, they all lie in a particular orientation with respect to the axis system labelled X, Y and Z. These axes relate to the World co-ordinates as follows:

Shipbuilding
X = FORWARD -X = AFT
Y = PORT -Y = STARBOARD
Z = UP -Z = DOWN

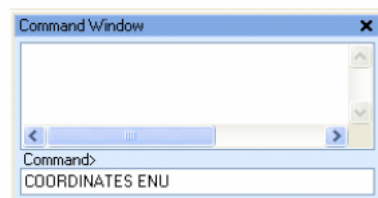


Process / Plant
X = EAST -X = WEST
Y = NORTH -Y = SOUTH
Z = UP -Z = DOWN

These World Coordinates are displayed at the bottom of the design framework, the default is set to E, N, U but can be changed to X, Y, Z by entering COORDINATES XYZ or COORDINATES ENU In the Command Window



World Coordinates: X 41708.37, Y -2821.00, Z 14593.00



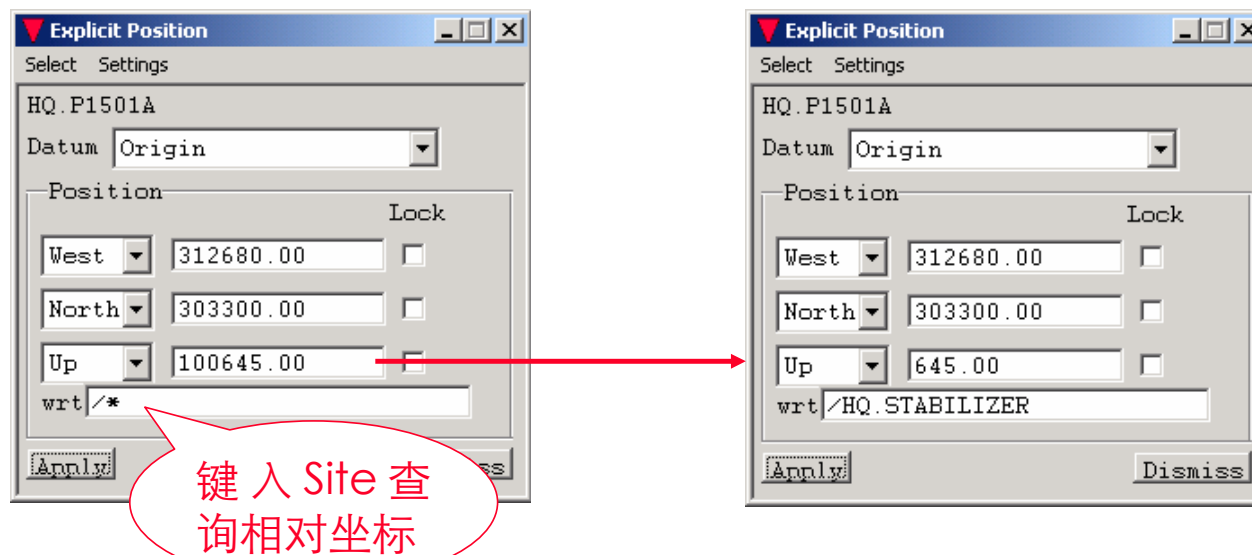
World Coordinates: E 41708mm S 2821mm U 14593mm

VANTAGE Plant Design

精确定位



- ▼ 精确定位和相对定位
 - Position>Explicitly(At)



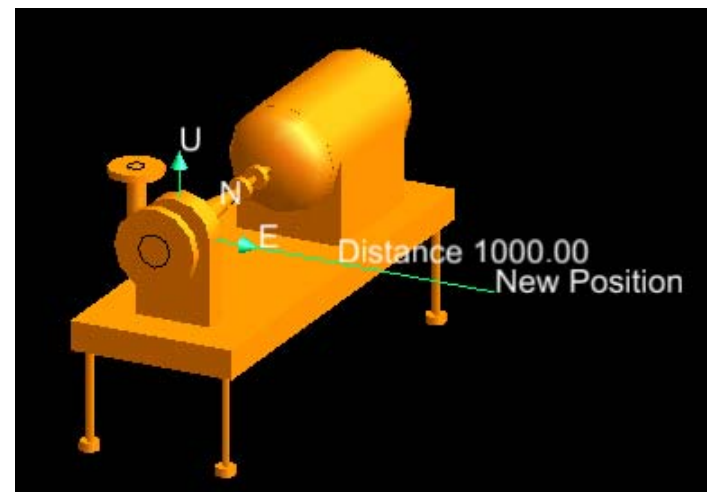
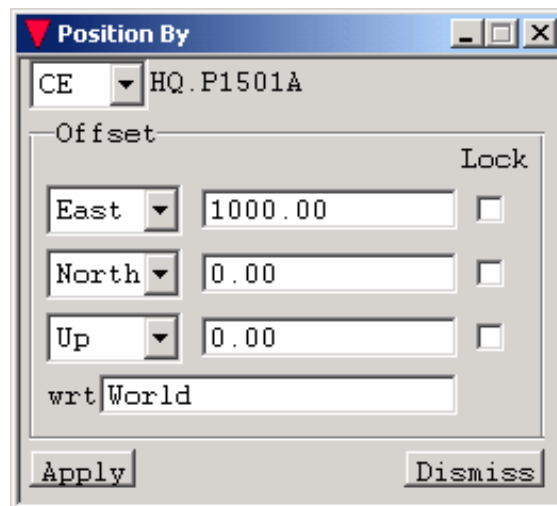
- WRT框中可以输入的内容：/*,world,site,zone及具体的名字

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相对定位



- ▼ 相对设备的定位点移动
 - Position>Relatively(By)



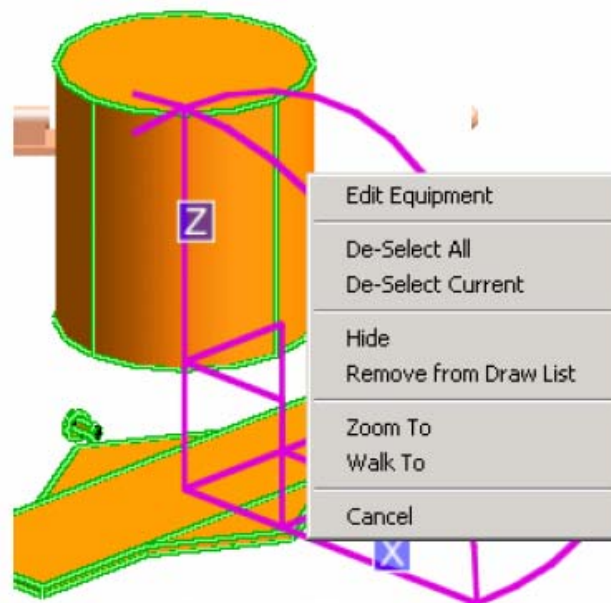
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参考定位



▼ 其他定位方法

- 对齐Through
- 参考定位方法Distance, Clearance
- 图形定位Model Edit
- Drag



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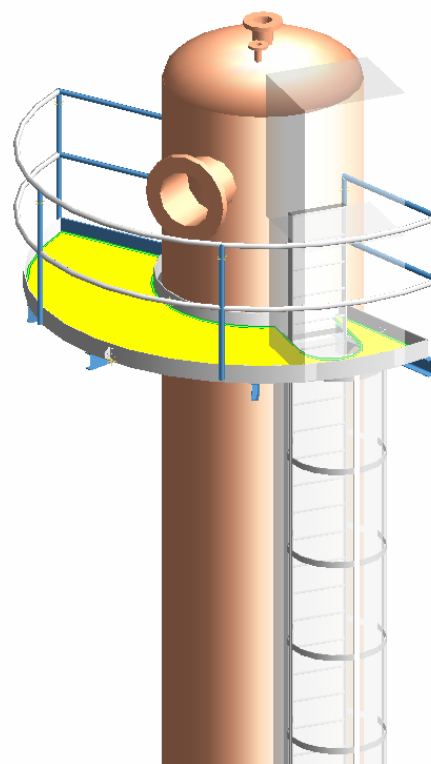
设备附加结构



设备平台，楼梯



- ▼ 附加结构层次
 - Structure



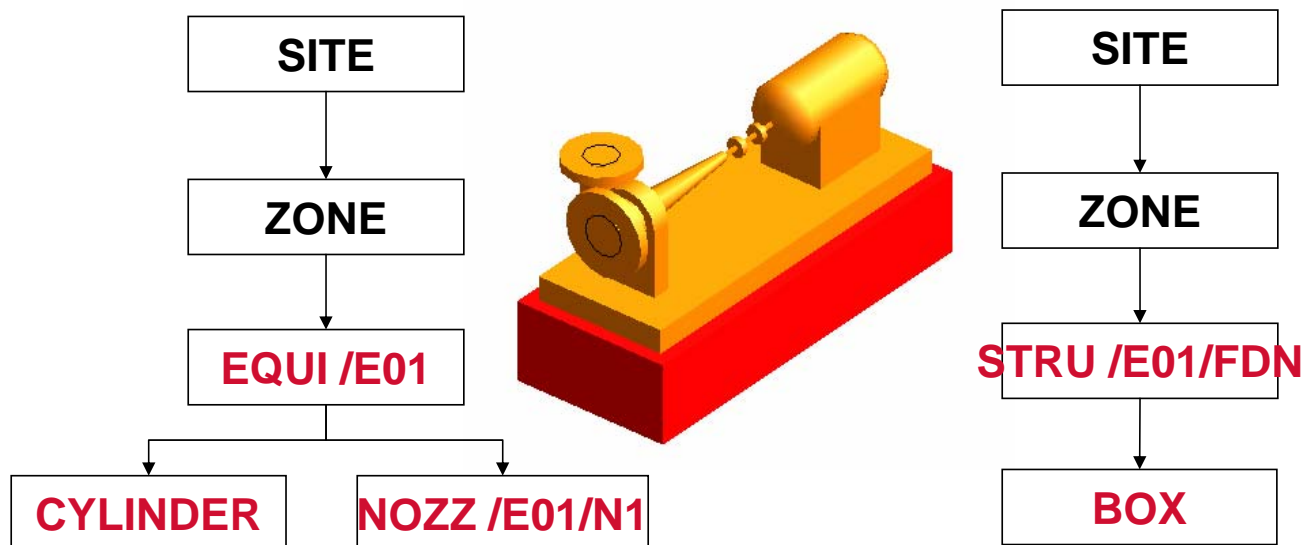
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设备基础



▼ 命名规则

— 设备名称/FDN



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设备基础定位



▼ 设备基础定位

- Stru水平定位与设备定位点一致
- Stru标高以基础顶面为准

