

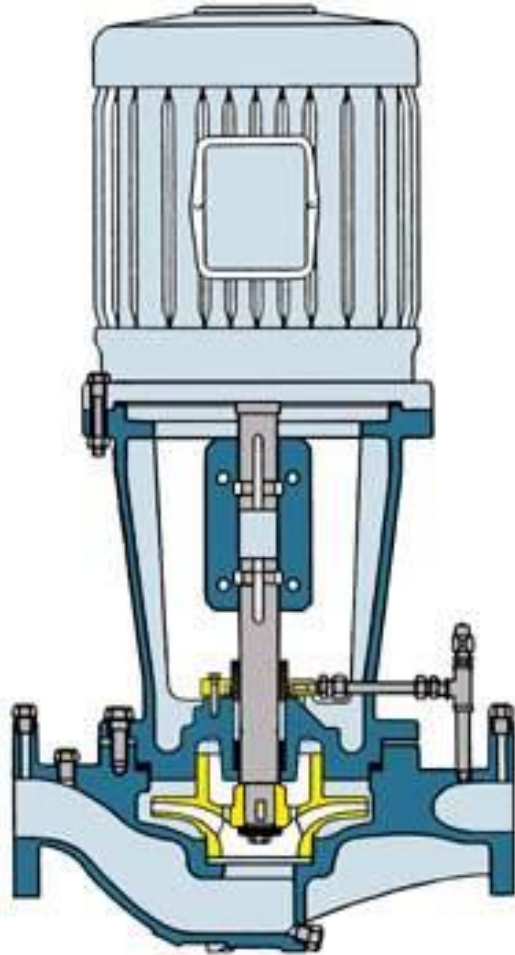
***ADVANCED  
DESIGN IN  
HVAC  
USING  
VERTICAL  
INLINE  
PUMP***



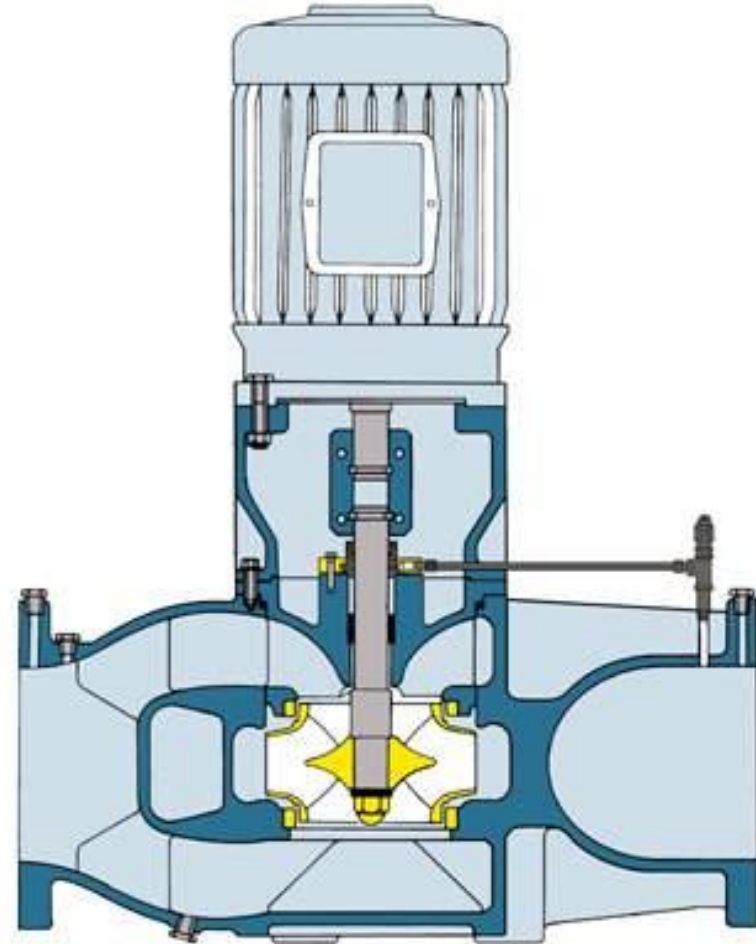
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# Split Coupled type Vertical In Line Pumps



**SINGLE SUCTION**



**DOUBLE SUCTION (12" & UP)**

# **Vertical In-Line**

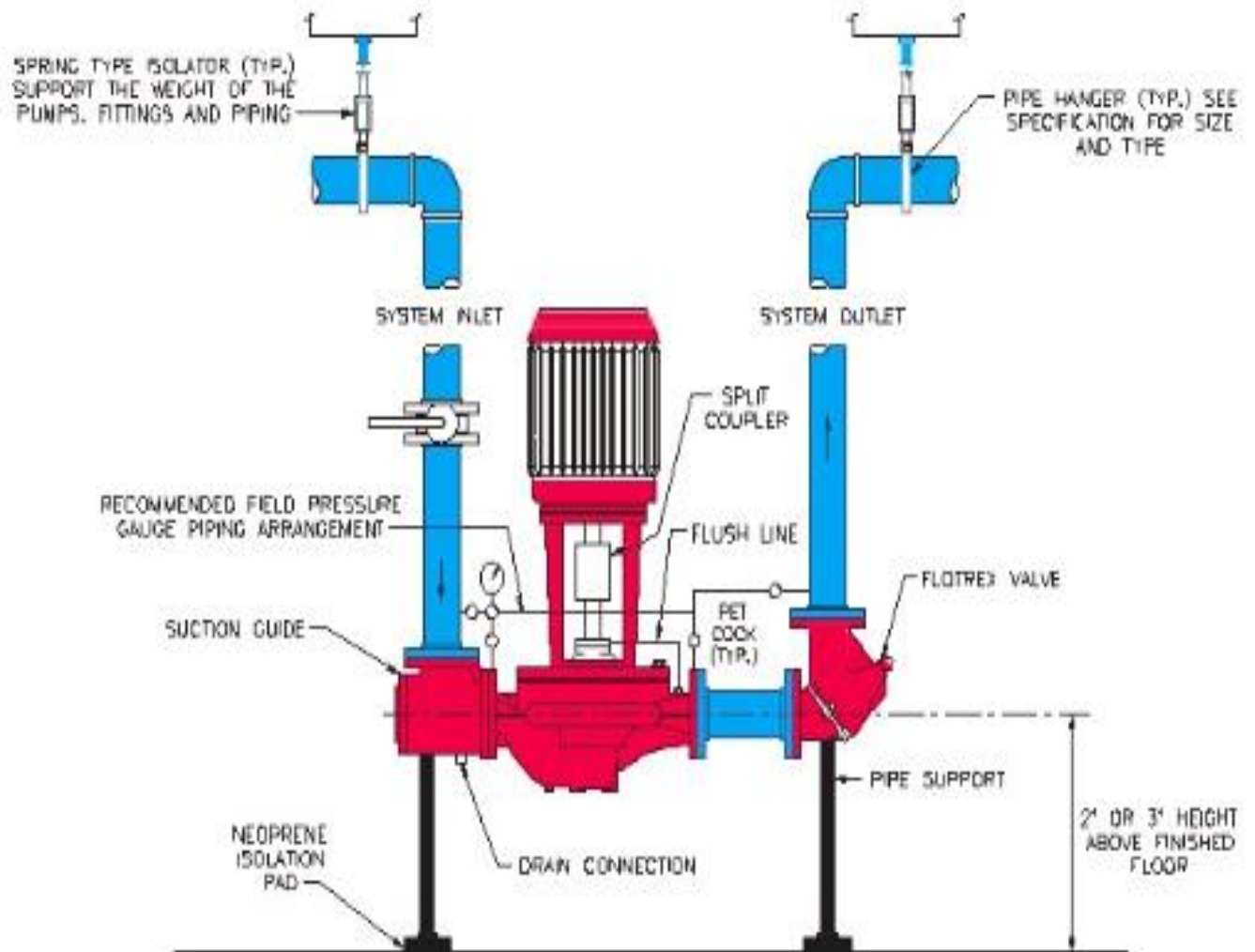
## **History**

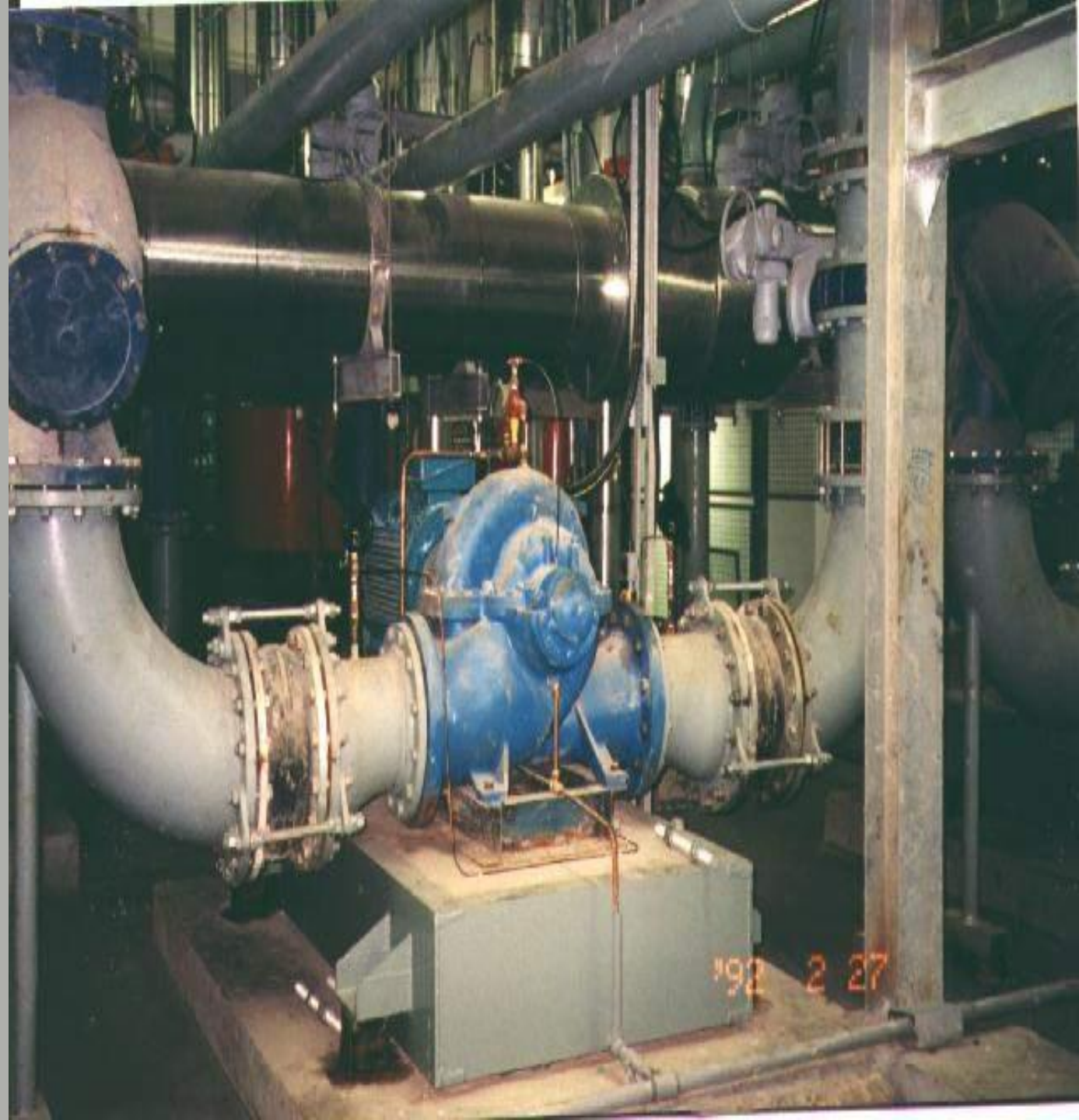
- First VIL developed in 1921 by United Pumps for use in the oil industry
- Today verticals range extends to a size 20x20x19. Flows exceeding 10,000 USGPM at 180 feet of head.
- Vertical in lines are not a new, they have been proven and used in many buildings throughout the world.

# Four Major Criteria to Consider between Vertical In Line and Traditional Base Mounted Pumps

- A. Floor Space
- B. Ease of Installation
- C. Maintainability
- D. Reliability

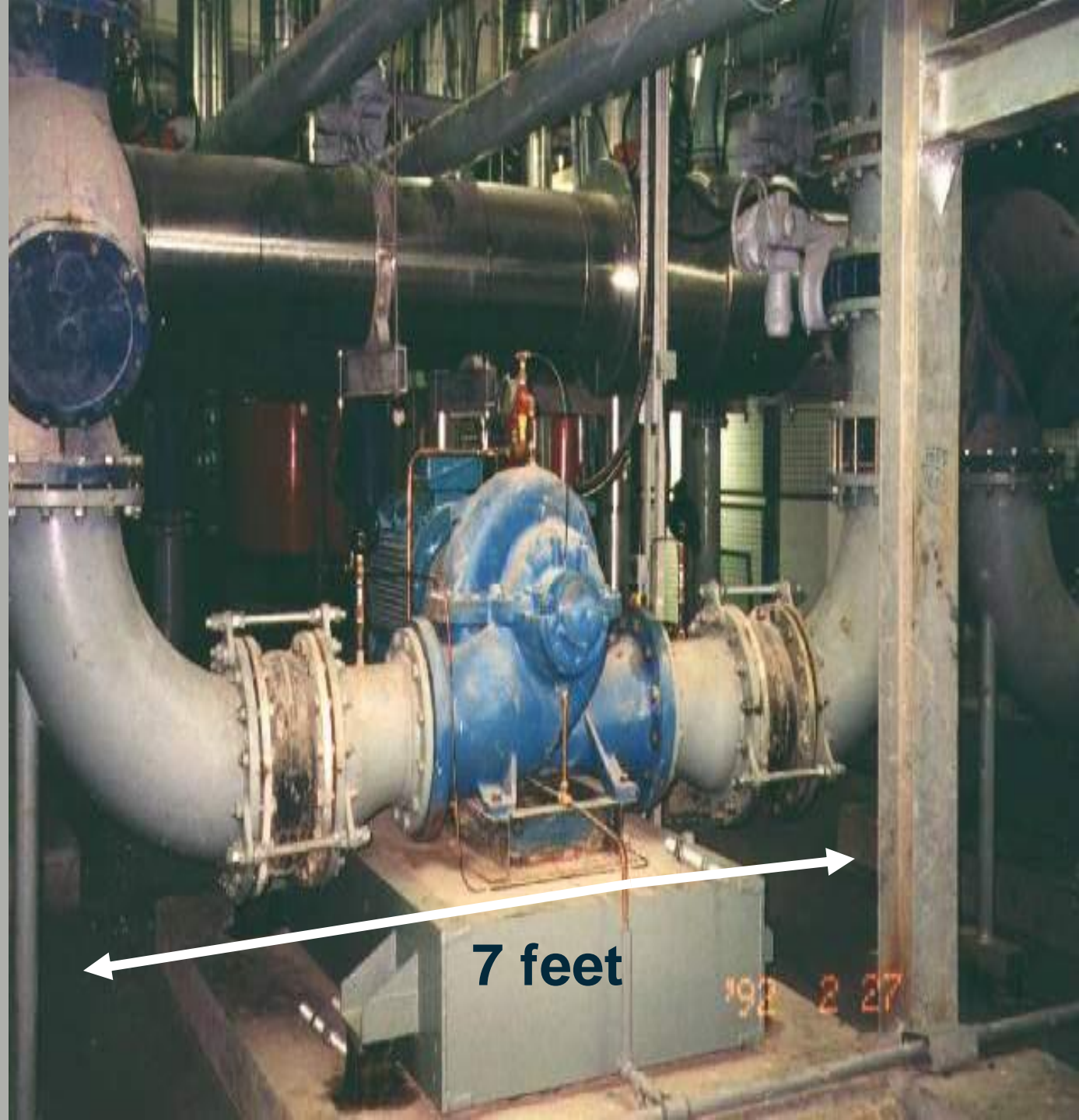
# LESS FLOOR SPACE





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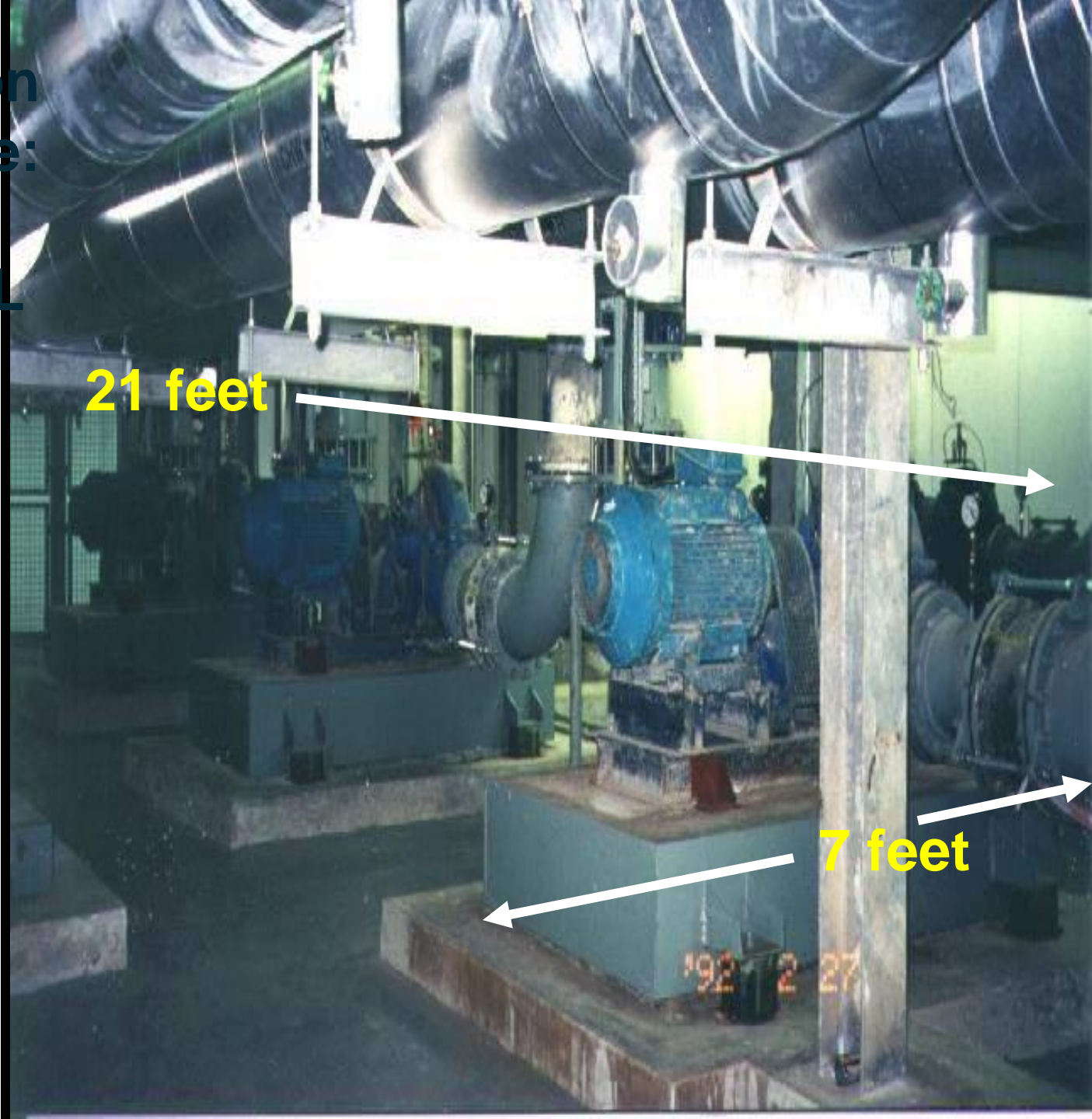
7 feet

191 2 27

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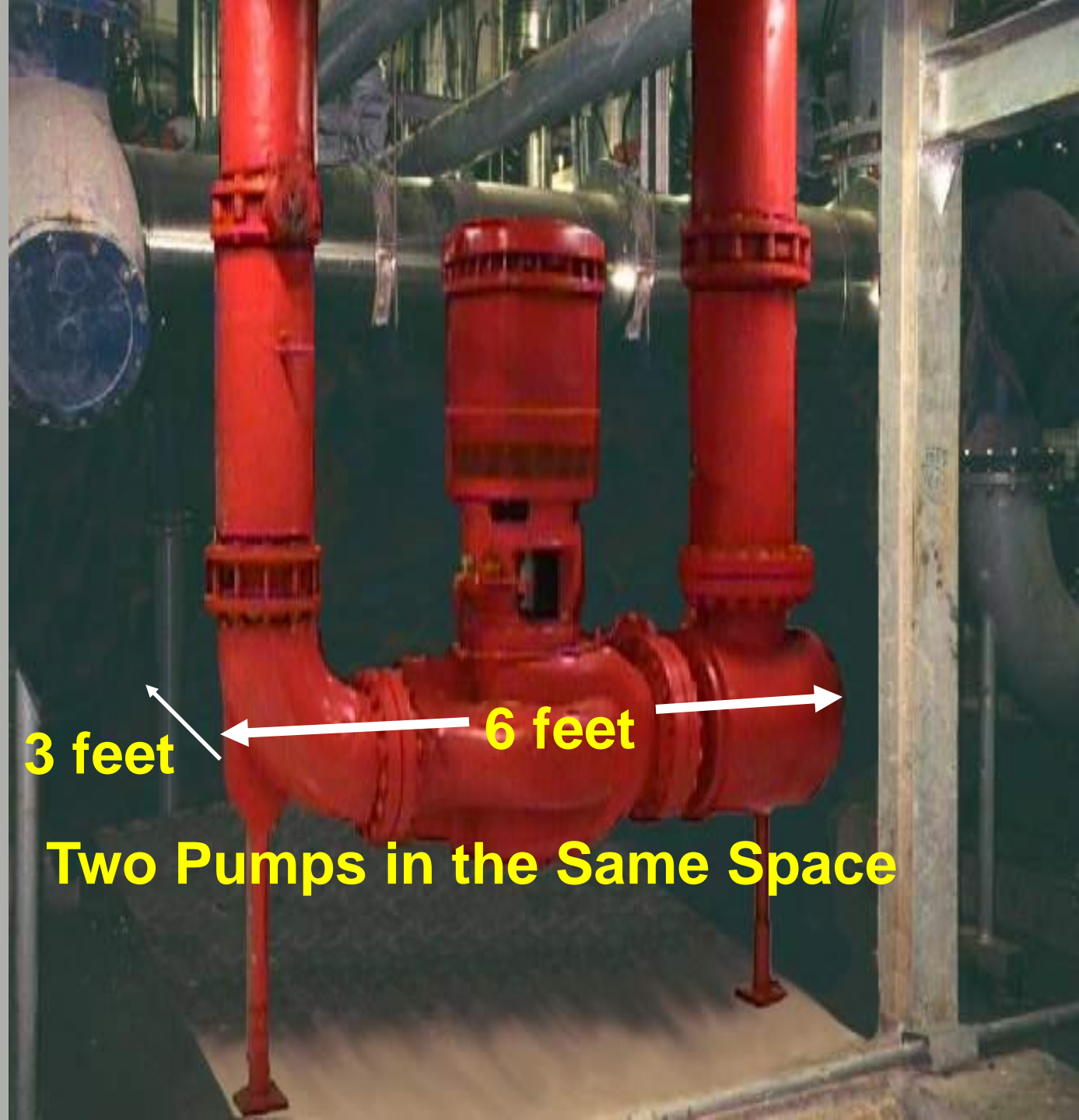
**Double Suction  
Pumps require:  
-30% more  
space than VIL**





# Space Required for Horizontal Split Case Pump





3 feet

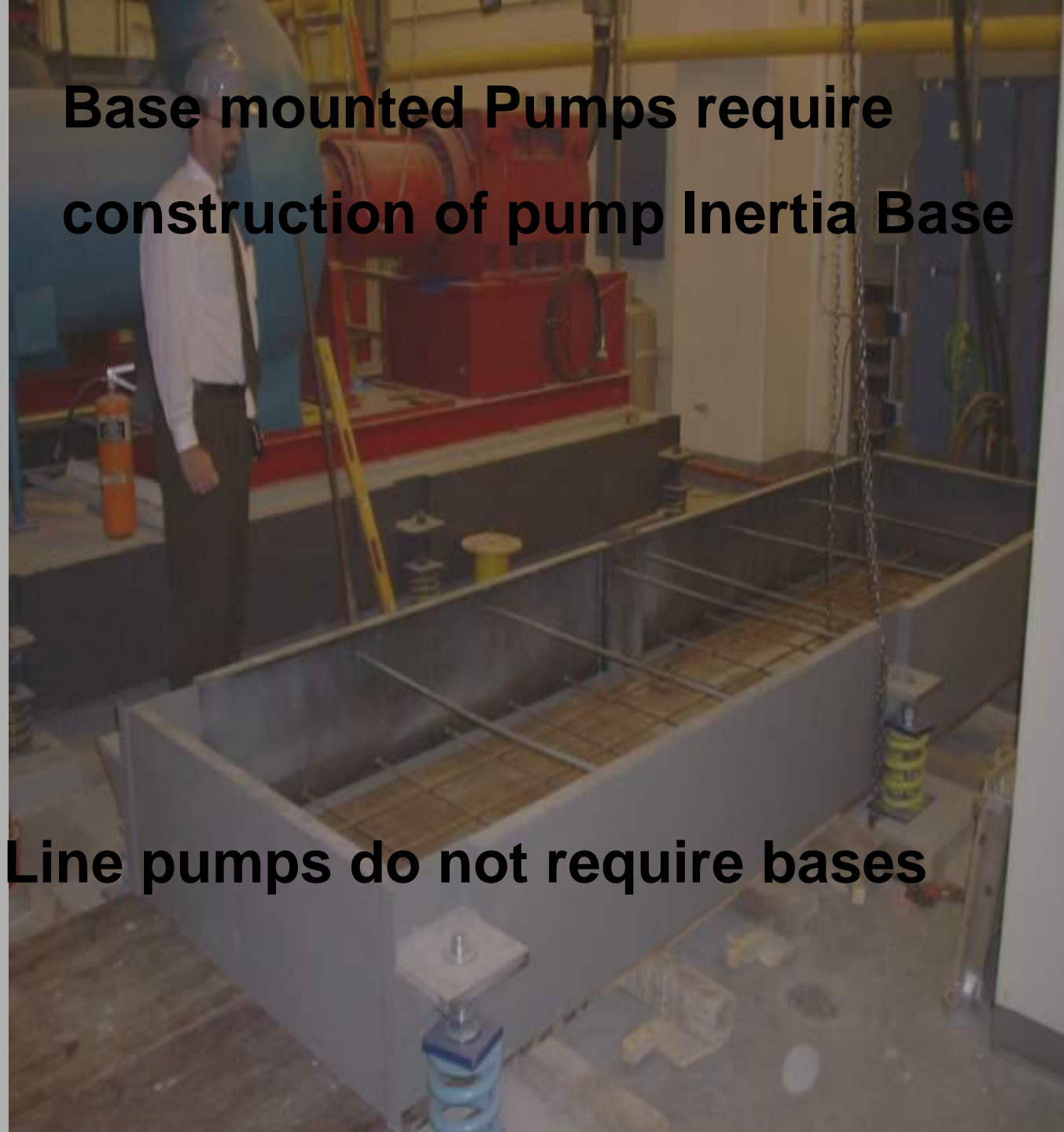
6 feet

Two Pumps in the Same Space

# EASE OF INSTALLATION



**Base mounted Pumps require  
construction of pump Inertia Base**

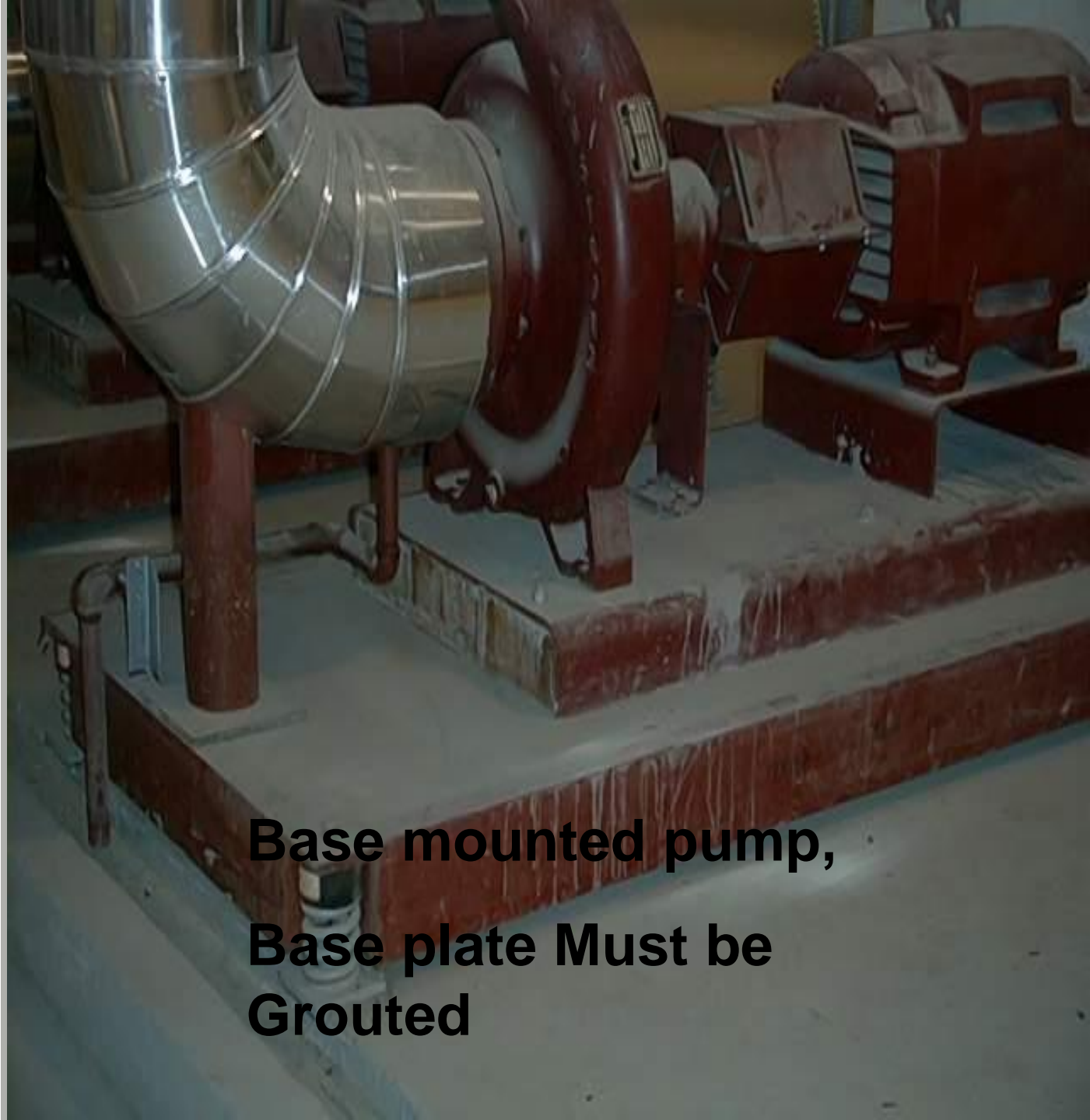


**Vertical In Line pumps do not require bases**

**Vertical in line pumps do not require  
field alignment**

**Base mounted pump,  
Base plate Must be Grouted**

**Coupling must be aligned**



**Base mounted pump,  
Base plate Must be  
Grouted**

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**Reduced Installation Time**

**Installation cannot be started  
until pumps are on site**





# Vertical Pump Advantage

**Consider Installing  
a Pipe Spool Piece.  
Piping installation  
can begin as  
soon as pumps  
are ordered.**



**Vertical in line  
Pumps can be  
installed as easy  
as a standard  
Gate valve**



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# Flushing Piping System After construction



# After Construction is completed, Install the Pumps

**Advantages**

**No Damage  
to the motor  
to the Mechanical Seal**



**Vertical In Line pump  
Size 16x16x19 350hp  
being dropped into  
place between the  
flanges. Only one man  
is required to do  
the installation  
(Enwave Project Toronto)**



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**TSMC Taiwan  
40 VIL 100 to  
250HP  
using the VIL  
advantage to  
reduce  
construction  
time**

**Spool Piece installed**

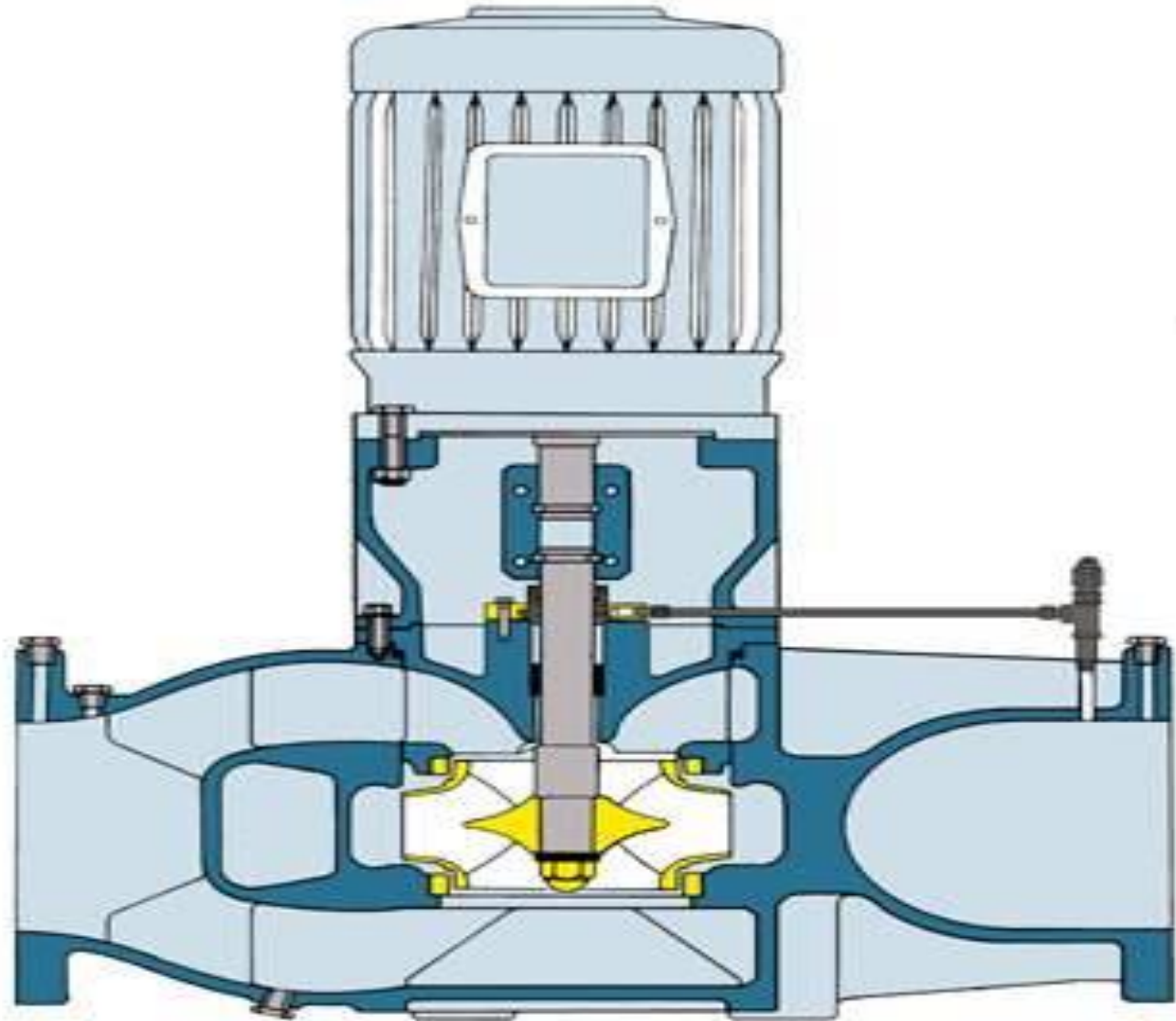


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# MAINTAINABILIT Y





# Mechanical Seal Replacement

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# VERTICAL IN-LINE PUMP

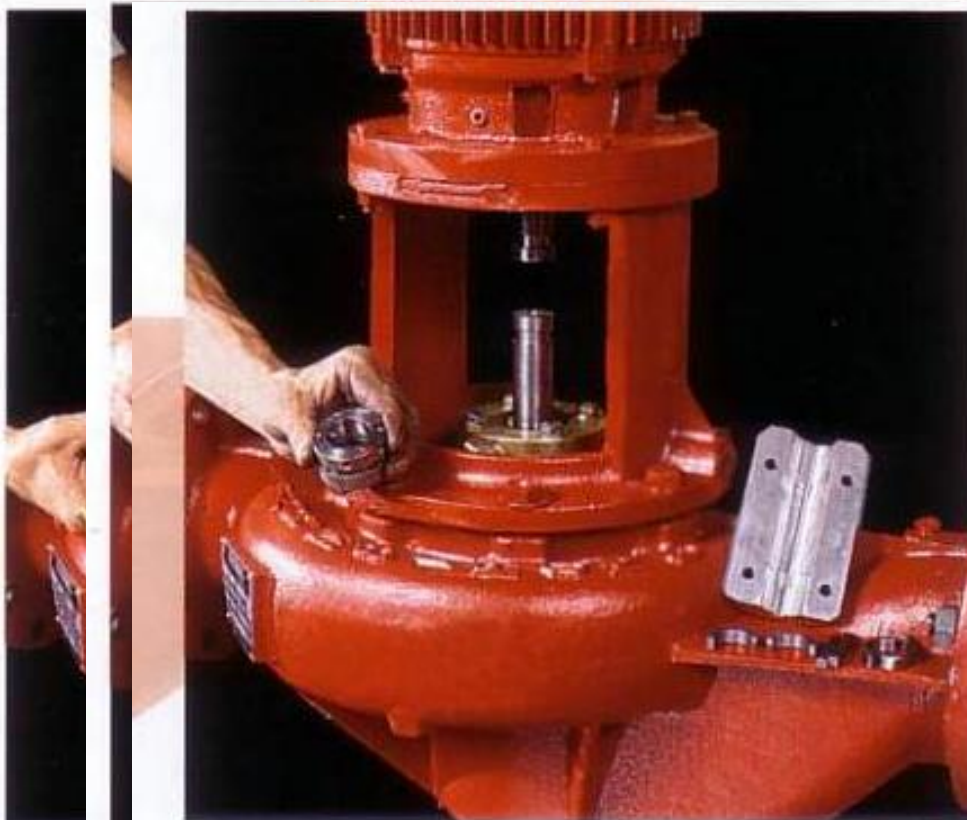
**SPLIT COUPLED** The axially split, spacer type rigid coupling permits seal maintenance without disturbing the pump or motor connections. The mechanical seal is accessible and easily replaced. (Outside multi-spring balanced mechanical seal is illustrated)



1) Split coupling removed. Coupling is rotated to allow the coupling to be removed.



3) Disconnect seal plate bolts. The seal plate can then be taken out. With inside seal removed, follow



3) Disconnect seal plate bolts. The seal plate can then be taken out. With inside seal removed, follow

4) New seal may now be installed. Reverse the procedure: Install new seal, replace gland plate, replace coupling and restart pump. Rigid coupling retains factory alignment.

and slide from pump shaft.

Compared to vertical in line pumps  
Double suction pumps require many hours  
to change the mechanical seals



**HSC pumps require two mechanical seals  
and two bearings**

**Vertical in line pumps require only one**



# COUPLING FAILURES

Coupling not aligned at start up

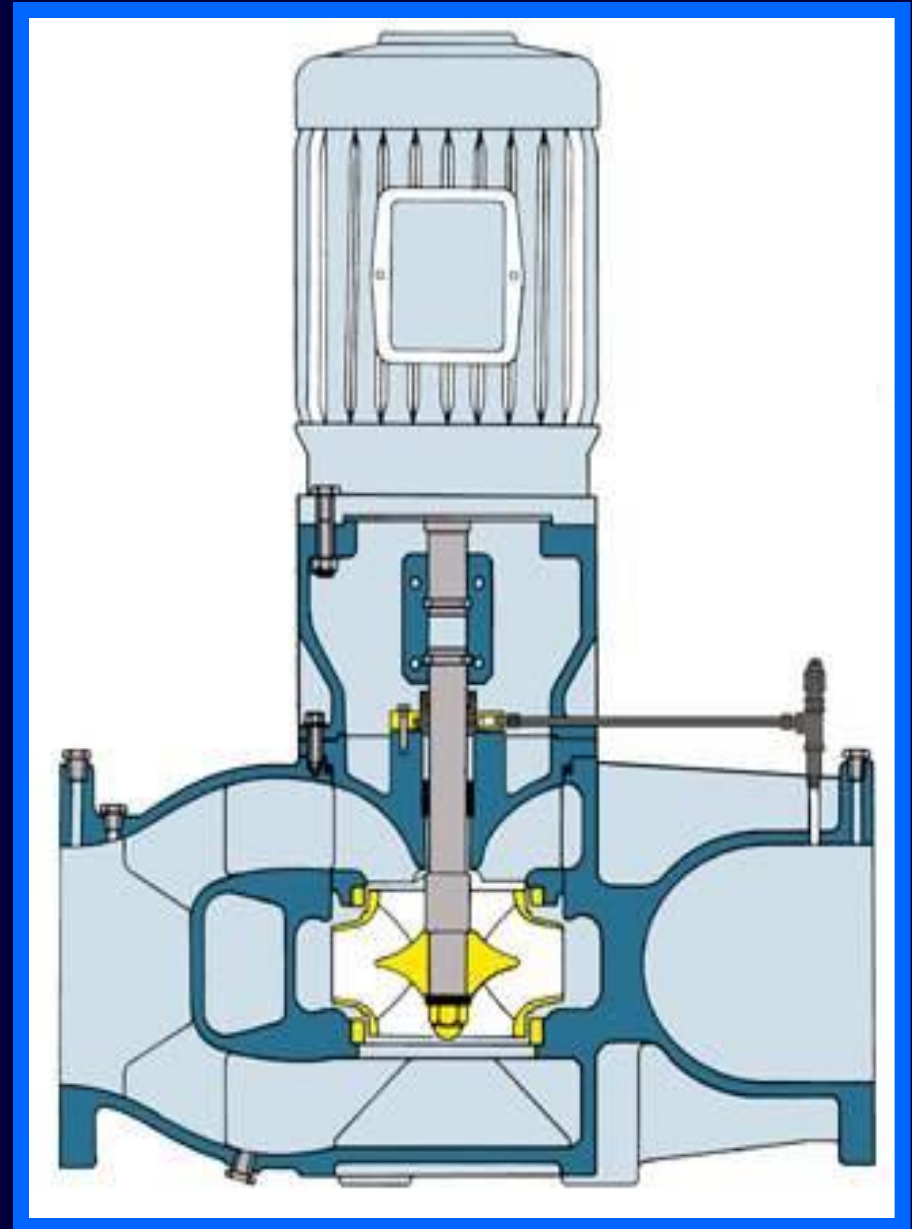


Base mounted pumps need to be aligned and base plates grouted

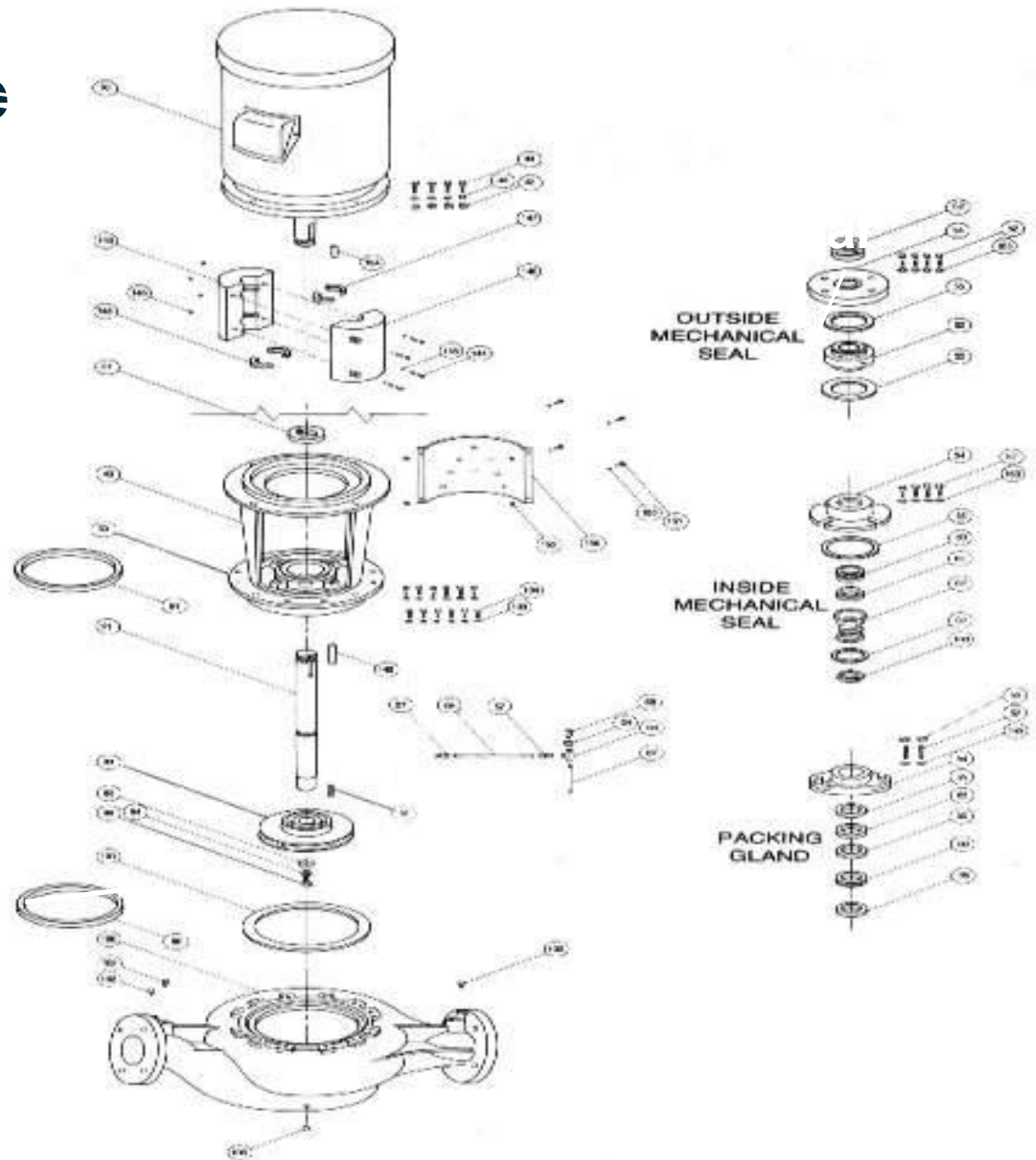
**Vertical In Line pump couplings do not require field alignment and have no bases to be grouted. Pump and motor are always in 100% alignment -Vibration free!**



**Vertical In Line  
pumps require  
Fewer Spare  
Parts than  
conventional  
base mounted,  
Single and  
Double suction  
pumps**



# Vertical In Line Parts







# IVS SENSORLESS PUMP



# Armstrong Dualarm Pumps

dualArm  
with  
SG and FTV Trim



• Built-in Isolating Valves

• Individual pump  
Check Valves



Durham College 2004 Ontario Canada  
Size 8x8x10 20hp



Durham College 2004 Ontario Canada

Size 8x8x10 20hp

AR

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Torpharm

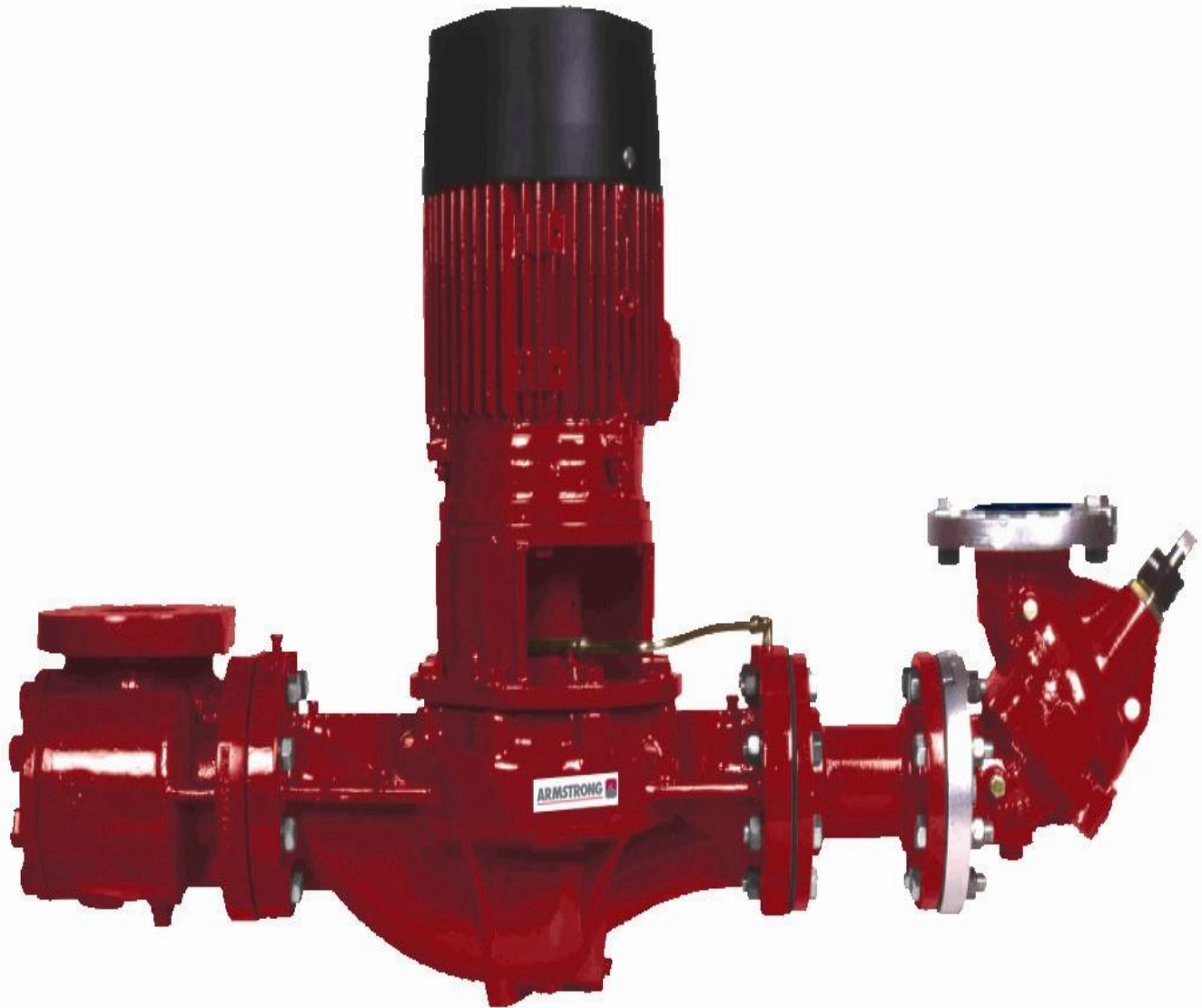


**This is not an Alternate to  
a true Vertical In line**

**This type of Vertical pump  
Requires a base and flexible couplings**



# THANK YOU



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