

# COMPARISON BETWEEN CHILLED WATER SYSTEM AND VRV SYSTEM

- ❑ SPECIALLY FOR PLENITUDE BERHAD
- PRESENTED BY IR. ANDY GOH (ONE ALPHA GROUP)



# CONTENTS

- CHILLED WATER & VRV
- AIR COOLED CHILLED WATER SYSTEM
- WATER COOLED CHILLED WATER SYSTEM
- SYSTEM DESCRIPTION – CHILLED WATER
- VRV SYTEM
- SYSTEM DESCRIPTION – VRV (ROOF)
- SYSTEM DESCRIPTION – VRV (FLOOR)

# CHILLED WATER & VRV

- CHILLED WATER SYSTEM
  - AIR COOLED
  - WATER COOLED



- VRV (VARIABLE REFRIGERANT VOLUME)
  - ROOF TOP
  - PER FLOOR



# AIR COOLED CHILLED WATER SYSTEM

- SMALL MEDIUM SCALE PROJECT
- LOWER EFFICIENCY
- SMALL PLANT ROOM REQUIRED
- REQUIRED OUTDOOR/ ROOF SPACE
- SUITABLE/ PREFERABLE FOR SMALL OFFICE, BUDGET HOTEL, LECTURE HALL
- EASY FOR FUTURE MODIFICATION, RENOVATION, ADJUSTMENT ON SITE TO SUIT TENANT REQUIREMENT
- CHEAPER REFILL MEDIUM. ONLY REQUIRED WATER.



# WATER COOLED CHILLED WATER SYSTEM

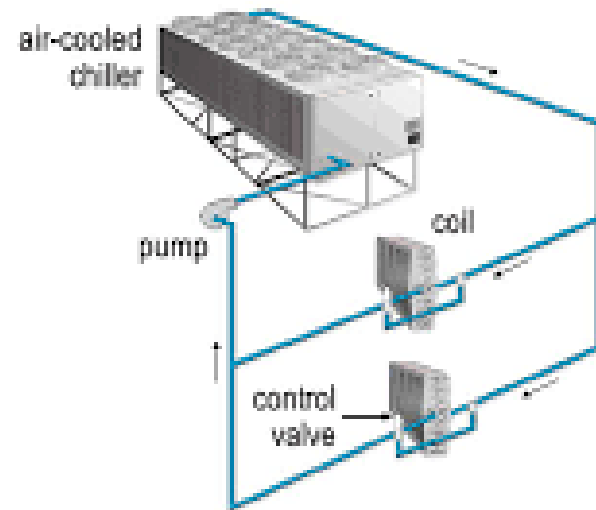
- FROM BIG TO LARGE SCALE
- HIGH AND EFFICIENT SYSTEM
- BIGGER PLANT ROOM
- INDOOR PLANT ROOM IS NEEDED
- SUITABLE/ PREFERABLE FOR MIX DEVELOPMENT, HOTEL, HOSPITAL, SHOPPING MALL, PREMIUM OFFICE
- EASY FOR FUTURE MODIFICATION, RENOVATION AND ADJUSTMENT ON SITE TO SUIT TENANT REQUIREMENT
- CHEAPER REFILL MEDIUM. ONLY REQUIRED WATER

# SYSTEM DESCRIPTION – CHILLED WATER

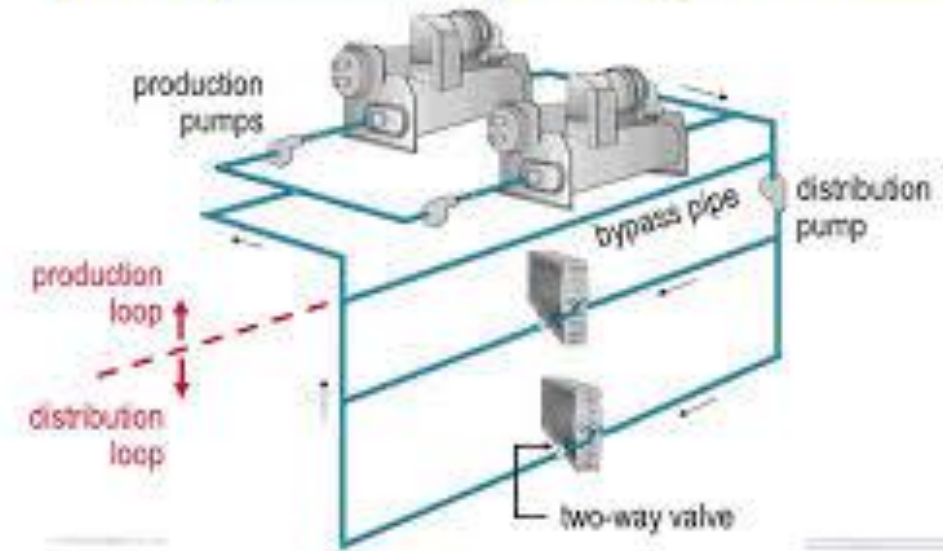
- Air cooled or Water cooled chillers
- Constant primary loop chilled water pumps
- Variable speed secondary loop chilled water pumps
- Air Handling Unit/ Fan Coil Units
- Insulated chilled water pipes distribution system
- Side stream filtration system for CHW
- Cooling tower located on Roof/ Open Space
- Condenser water pipes distribution system
- Chemical/ Non Chemical treatment for Condenser water
- Building Management System
- Energy Meter System

# SYSTEM DESCRIPTION – CHILLED WATER

## Chilled-Water System



## Primary-Secondary Configuration





# VRV SYSTEM

- SMALL MEDIUM AND LOW RISE BUILDING
- MEDIUM EFFICIENT SYSTEM
- SMALLER PLANT ROOM (CAN BE LOCATED ON ROOF OR PER FLOOR BASIS)
- REQUIRED OUTDOOR/ ROOF SPACE
- SUITABLE/ PREFERABLE FOR SMALL OFFICE, BUDGET HOTEL, LECTURE HALL
- SYSTEM IS NOT FLEXIBLE FOR MODIFICATION AND RENOVATION.
- EXPENSIVE REFRIGERANT COST IF LEAKING

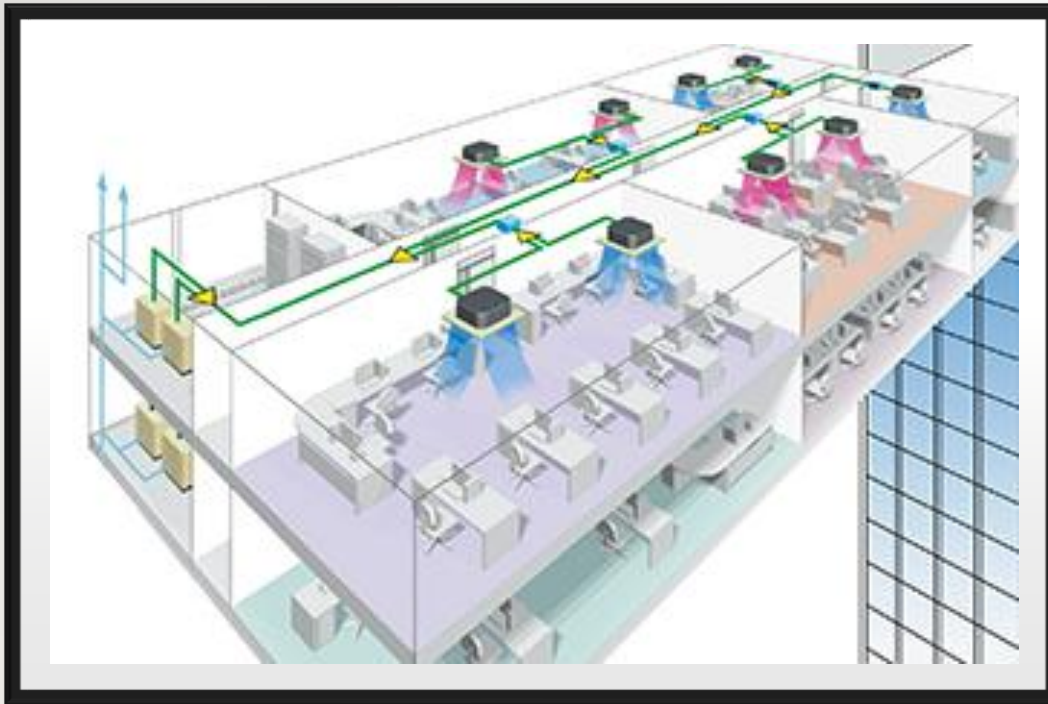


## SYSTEM DESCRIPTION – VRV (ROOF)

- Outdoor unit located on roof
- Indoor unit in conditioned space
- Refrigerant copper pipes from Roof to every floor to every indoor unit
- Intelligent controller system including power proportion distribution (PPD) system for energy metering



## SYSTEM DESCRIPTION – VRV (FLOOR)



- Outdoor unit located on each floor (AC ledge is required)
- Indoor unit in conditioned space
- Refrigerant copper pipes for each floor.
- Intelligent controller system including power proportion distribution (PPD) system for energy metering

# RECOMMENDATIONS

- EVERY AIR CONDITIONING SYSTEM HAS THEIR OWN PRO AND CONS
- SELECTION OF THE SYSTEM IS VERY MUCH DEPENDS ON TYPE OF BUILDING AND SCALE OF THE BUILDING
- BUILDING WHICH REQUIRED FREQUENT RENOVATION SUCH AS MALL, HOTEL AND OFFICE IS PREFER TO USE CHILLED WATER SYSTEM
- BUILDING WHICH DO NOT NEED MUCH RENOVATION SUCH AS SMALL OFFICE, BUDGET HOTEL AND LECTURE HALL MAY CONSIDER VRV SYSTEM
- HOWEVER, CHILLED WATER SYSTEM REQUIRED ONE EXPERIENCED FACILITY TEAM TO MANAGE THE SYSTEM COMPARE TO VRV SYSTEM





# THANK YOU

ANY ENQUIRIES KINDLY CONTACT US...

GENERAL/ HUNTING LINE: +60 3 7610 4543/ 44

IR.ANDY GOH: +60 12 659 8118