



# Datacenter valve solutions



Expect... 





## ICV™ - a proud member of the AVK group

The AVK Group, a family business founded in 1941 and headquartered in Denmark, is one of the leading manufacturers of valves and fittings within the water, gas, waste water, industrial, HVAC and fire protection industries worldwide and has 85+ sales companies and 70+ factories globally within our core business. AVK Group owns its own foundries and develops, machines, coats and produces in its own valve factories. AVK Gummi produces high quality rubber and sealing used in AVK valves and in 3rd party machinery- and medical equipment in other industries.

ICV – IC Valves (Nanjing) Co., Ltd. is the building service and HVAC brand of the AVK Group in Denmark and is a fully owned subsidiary. ICV offers general valves, motorized valves, and balancing valves, and hydraulic balancing valves for use in buildings and HVAC system....for dedicated solutions in commercial buildings, for district cooling and heating, and for datacentres and other constructions...to solve all standard valve requirements for HVAC, plumbing and hydraulic balancing, manual fire & safety valves.

85+

Sales offices globally

70+

Valve and related factories globally

90+

How many countries are AVK located in

3800+

over 3800 employees globally







## HUAWEI DATACENTERS

Huawei Suzhou Corporate Business datacentre  
Huawei Suzhou Laboratory datacentre  
Huawei Semiconductor Plant datacentre

ICV is a key supplier to Huawei of high quality valves for their investments in R&D facilities, production facilities, offices and employee residences i.e. Huawei Songshanhu phases 1&2, Huawei Songshanhu employee apartments, Huawei Songshanhu fire & safety project, Huawei E2C projects, Huawei Hupan Lake Garden projects, Huawei Green Gardens, Huawei Chengdu Hetian Grand Hotel, Huawei Hangzhou production plant, Huawei Wuhan Research and Development Center, Nanjing Huawei projects etc.



中国移动  
China Mobile

## CHINA MOBILE

China Mobile Hubei Branch Guanggu datacentre  
China Mobile Henan Branch datacenter  
China Mobile Shenzhen Information Building  
China Mobile Jiangxi Hongjiaozhou production plant  
China Mobile Zhengzhou high-tech mobile datacenter



## CHINA UNICOM

China Unicom Henan Zhengzhou datacenter (2nd phase DC3)



## SUZHOU INTERNATIONAL SCIENCE-PARK DATA CENTER

4200 standard servers, totally 52000 m2  
Suzhou International Science-Park datacentre



## Hainan Airlines South datacenter

Hainan Airlines South datacentre  
Hainan Airlines datacentre



# Cases

Infrastructure and equipment providers • communication and service providers • high tech science and data providers • banking, science and other high tech company internal IT networks

## ASIA



Shanghai Dingyi datacentre

### Singapore



Kingsland Development  
M&E Consultant: i3 Critical Facilities Pte Ltd  
Project GFA: 20,000m2  
Series 76 DN65-400 600pcs. Series 756 DN600-800 120pcs



Singtel  
M&E Consultant: DSCO Group  
Project GFA: 53,000m2  
Series76 butterfly valves DN65-400 600pcs.  
Series 756 DN450-1100 145pcs.



Ascenda Singbridge and DSCO Group  
Ascendas Singbridge Data Centre. 2019  
Project GFA: 40,000m2  
Series 76 concentric and Series 756 double eccentric butterfly valves etc.

### Other:

Singtel west data centre. DSCO Group 2019  
M7 Data Centre DSCO Group 2017  
Singtel Geylang Telephone Exchange Tan Consultants 2016  
Singtel West Data Centre DSCO Group 2015  
Starhub Data Center DSCO Group 2015  
Kingsland Data Center i3 Critical Facilities 2015  
Singtel Fort Site ST Electronic 2014  
Singtel Pegasus ST Electronic 2014  
Nanyang Poly 2014

### Philippines

Makati CBD PLDT Engr. Ramon Aguiluz 2017

756	Double eccentric double flanged butterfly valve	DI body and disc, AVK EPDM, epoxy coated, PN10/16/25, DN200-1400, flanged
76	Centric wafer and lug butterfly valve	DI body, DI/SS316 disc, AVK EPDM, epoxy coated, PN16, DN50-400, wafer/lug
925	Centric wafer, lug, and double flanged butterfly valve	DI body, DI/SS304/SS316 disc, epoxy coated, PN16/25, wafer/lug DN50-600, flanged DN50-1200
02	Resilient seated non-rising gate valve	DI body, AVK EPDM disc, epoxy coated, PN10/16, flanged, WRAS approved
9002	Resilient seated non-rising valve valve	DI body, AVK EPDM disc, epoxy coated, PN10/16, flanged
21	Resilient seated rising or non-rising gate valve	DI body, AVK EPDM disc, epoxy coated, PN10/16, flanged, DN50-400, WRAS approved
37	Metal seated rising or non-rising gate valve	DI body, brass seated, epoxy coated, PN10/16/25, flanged, DN50-300, WRAS approved
54	Metal seated rising or non-rising gate valve	DI body, brass seated, epoxy coated, PN10/16/25, flanged, DN350-1800, WRAS approved
53	Ball check valve	DI body, AVK NBR ball, epoxy coated, PN10, threaded/flanged, DN32-600,
41	Swing check valve	DI body, AVK EPDM seat, epoxy coated DI disc, PN16, flanged, DN50-600 (series 641 up to DN1400)
903	Silent check valve central guided	903/00: DI body, SS316/304 disc/seat/stem, epoxy coated, PN16/25, flanged, DN50-600 903/01: DI body, SS316/304 disc/seat/stem, epoxy coated, PN16/25, Flanged, DN50-600 903/02: DI body, alu-bronze disc/seat/stem, epoxy coated, PN16/25, wafer, DN50-600 903/03: DI body, SS stem, DI epoxy coated disc, EPDM seat, epoxy coated, PN16/25, flanged, DN50-600 903/04: DI body, DI/copper alloy/NBR/SS internals, epoxy coated, PN16, flanged, DN50-500
904	Dual door check valve	DI body, SS316/304 disc/stem, EPDM seat, epoxy coated, PN16, wafer, DN50-600
910	Y-strainer	DI body, SS316/304 welded strainer, epoxy coated, PN16/25, flanged, DN50-600
902	Globe valve	DI/CI body/disc, bronze seat/trim, SS stem, epoxy coated, PN16/25, flanged, DN50-450
851	Dual function air valve	DI body, epoxy coated, DN16/25, threaded/flanged, DN25-200
912	Air valve	Brass, PN16, threaded, DN15-25
906 (910)	Bronze valves: globe, gate, check, ball (Y-strainer)	Bronze body, PN16/20/25, threaded, DN15-50
907 (910)	Stainless steel valves: globe, gate, check, ball (Y-strainer)	SS316/304 body, PN16/25, threaded, DN15-50
907/08	Stainless steel ball valves	SS304/SS316 body, PN16/25, DN15-250
901/01/02	Metal seated rising or non-rising gate valve	DI body, bronze trim, PN16/25, flanged, DN50-400
901/03	Stainless steel metal seated rising stem gate valve	SS304/316 body, PN16/25, flanged, DN50-300
910/05	Stainless steel Y-strainer	SS304/316 body, PN16/25, flanged, DN50-300
904/02	Stainless steel swing check valve	SS304/316 body, PN16/25, flanged, DN50-300
911	Flexible joint	EPDM body single/double sphere, PN16/25, threaded/flanged, DN15-600 SS316/304 body/braid, PN16/25, threaded/flanged, DN15-800
911	Expansion joint	SS304 body, galvanized steel flange/rod, PN16/25, DN32-1200

# ICV general valves

**The ICV range of general and manual valves covers all applications and includes very large ranges of butterfly valves, gate valves, check valves, strainers, joints, air valves, bronze and stainless steel valves etc. from DN15 up to DN4000 for certain types**









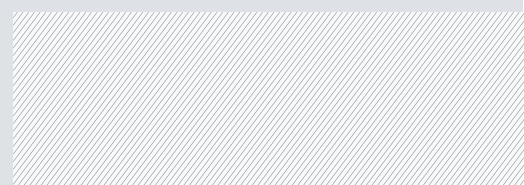
Member of the **AVK** Group

# ICV motorized valves

**The ICV range of motorized control valves offers precise modulating or on/off control for flow control all equipment from DN15 up to DN1200 and above and integrates into all SCADA and BAS systems**

756	Motorized double eccentric double flanged butterfly valve	220V/380V, IP67, control/feedback: on/off, modulating (0-10V, 2-10V, 4..20mA) DI body and disc, AVK EPDM, epoxy coated, PN10/16/25, DN200-1400, flanged Options: Rotork, AUMA industrial type actuators
925/76	Motorized centric wafer and lug butterfly valve	220V/380V, IP67, control/feedback: on/off, modulating (0-10V, 2-10V, 4..20mA) DI body, DI/SS304/SS316 disc, AVK EPDM, epoxy coated, PN16, DN50-400, wafer/lug Options: Rotork, AUMA industrial type actuators
925/06	Motorized centric wafer, lug, and double flanged butterfly valve	220V/380V, IP67, control/feedback: on/off, modulating (0-10V, 2-10V, 4..20mA) DI body, DI/SS304/SS316 disc, epoxy coated, PN16/25, wafer/lug DN50-600, flanged DN50-1200 Options: Rotork, AUMA industrial type actuators
920/01	Motorized on/off valve for fan-coils	DZR brass body, 2-way, threaded, on/off, 220V, DN15-25, PN16
920/02	Motorized control ball valves	Brass H62 body, 2/3-way, CI body, 2way, threaded/flanged, control/feedback: on/off, modulating (0-10V, 2-10V, 4..20mA), DN15-150, PN16, IP54
920/03	Motorized control stroke valves threaded	Brass H62 body, 2/3-way, threaded, control/feedback: on/off, modulating (0-10V, 2-10V, 4..20mA), DN15-80, PN16, IP54
920/04	Motorized control stroke valves flanged	CI GG25 body, 2/3-way, flanged, control/feedback: on/off, modulating (0-10V, 2-10V, 4..20mA), DN65-200, PN16, IP54

For even higher reliability for critical applications industrial type motoric actuators like AUMA or Rotork are also offered.  
For information on PICV please see under balancing valves

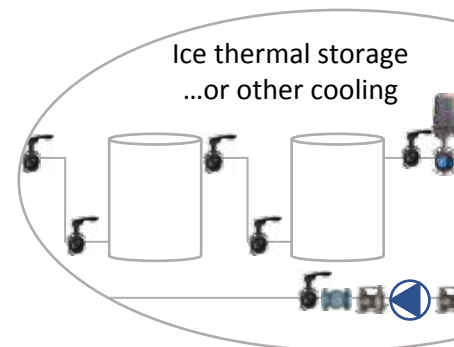
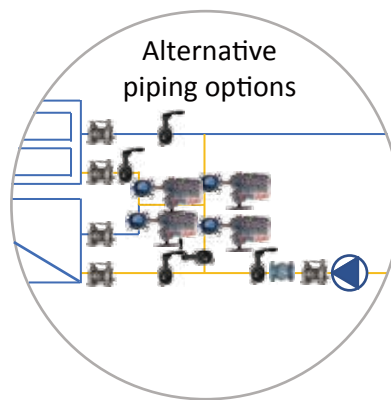
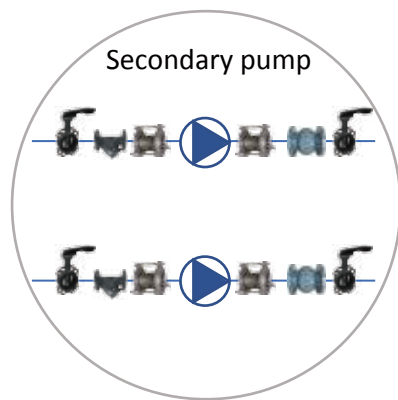


# ICV balancing valves

**The ICV range of balancing valves cover all balancing requirements accurately and reliably and support on commissioning and design is offered**

908/00	Deltaflow™ manual/static balancing valve flanged	DI body, epoxy coated, PN16/25 flanged, DN65-400, EQ design, accuracy to ±5%, pressure compensated DN250-400, lockable turn counter
908/02	Deltaflow™ manual/static balancing valves threaded	Bronze CC491K body, PN25, DN15-50, accuracy to ±5%, accurate turn counter
908/03	Deltacontrol™ differential pressure balancing valve	DI/DZR body, PN16/25, DN15-450, flanged/threaded, adjustable control pressure, accuracy to ± 5% PN25
951	Flowmaster™ 3-in-1 PICV – pressure independent motorized balancing control valve	24V/220V, motoric, control/feedback: on/off, modulating (0-10V, 2-10V, 4..20mA), IP54 DZR brass body, PN25, DN15-50, threaded, accuracy to ±5% CI body, PN16/25, DN65-200, flanged, accuracy to ±5%
955	Flowmaster™ pressure independent motorized balancing on/off valve	DZR brass body, PN25, DN15-25, threaded, accuracy to ±5% 24V/110V/220V, on/off, thermic actuator
952/953	Deltamatic™ dynamic/automatic balancing valve	DZR brass body, PN25, DN15-50, 0.007 – 3.154 l/s, accuracy to ±5% DI body, SS304/316 cartridges, PN25, DN50-800, 1.061 – 12,500 l/s, accuracy to ±5%
908/07	Measuring orifice	SS304/316, PN16/25, DN50-600+
920510XXX	Differential pressure bypass kit	Dp bypass kit 220-24V, control/feedback: on/off, modulating (0-10V, 2-10V, 4..20mA)
PFM	Balancing tool	Includes data on all ICV balancing valves for easy balancing





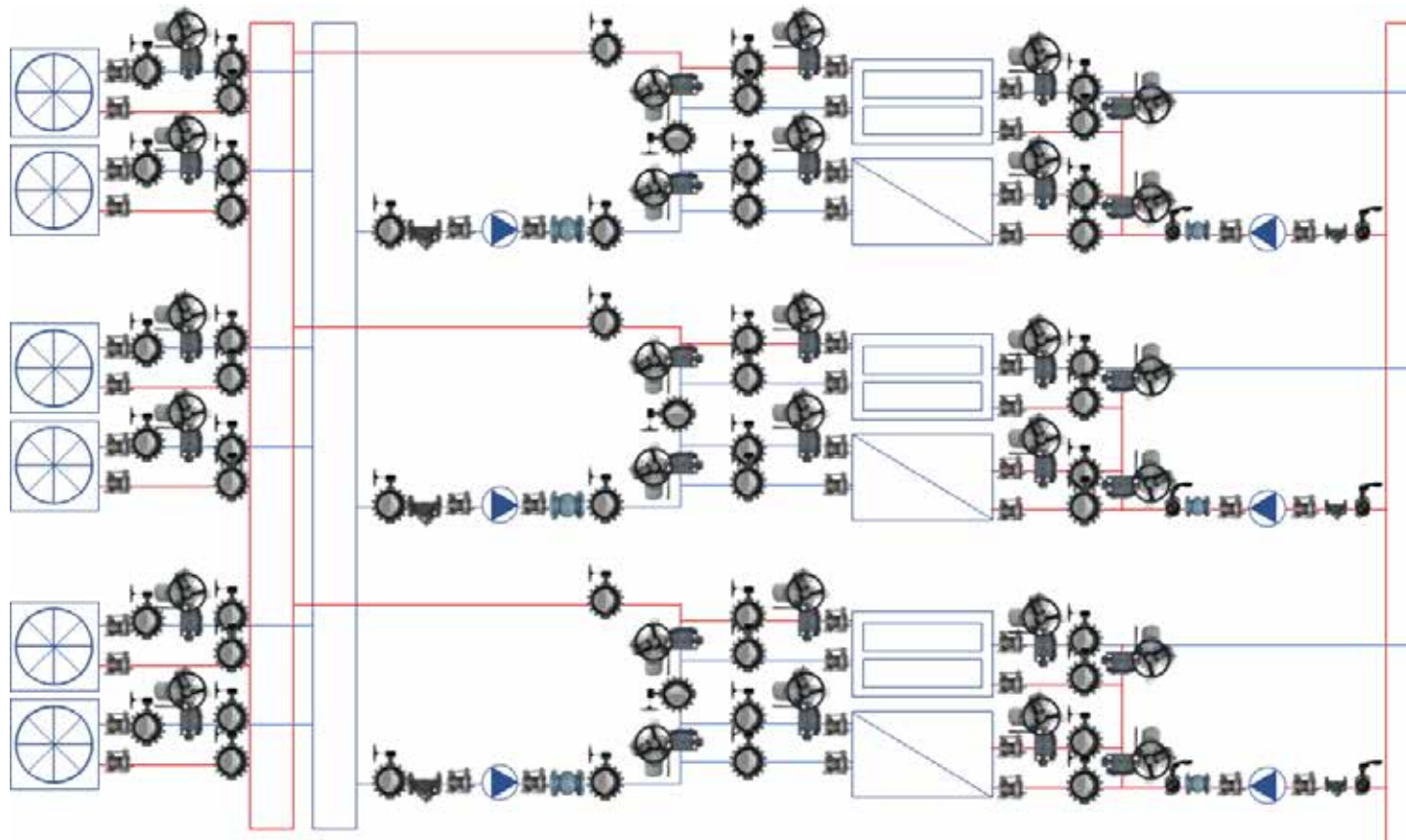
## Cooling towers and free cooling units

In cooler regions, free cooling units offer the possibility of cooling without the use of the chiller offering energy saving

## Pump units.

Optional secondary pump systems

## Chillers & heat exchangers (HEX)



# Chiller stations

**Recommended valve solution for primary energy generation. ICV ensures the investment through a reliable valve solution and a very wider offering - including also large valves a key strength of the AVK Group**

## Manifold / distribution

with (optional) secondary pumps



## Product recommendations

Double flange butterfly valves, especially double flange double eccentric butterfly valves like the ICV756 series which also has the option of stainless steel enforced ring and seat for extreme durability (alternatively the double flanged centric liner 925), and the ICV76 series lug or wafer centric liner types are recommended for sizes below (alternatively ICV925).

Every equipment and motorized control valve must be equipped with shutoff valves before and after to ensure that separate shutoff and drainage is possible without influencing the total system during regular maintenance or in case of equipment failure.

The same recommendations are valid for our motorized butterfly valves which are supplied with various actuator options including our HVAC standard ranges but also industrial type actuators from other suppliers are available. All are supplied with relevant control and feedback signals integrating seamlessly into any automation system.

Check valves must be installed after the pump to prevent against return water entering and possibly damaging the pumps. ICV's range of check valves is very wide and is built to last (i.e. ICV903 series, ICV41 series).

ICV's strainers with welded stainless steel filter in large valve bodies ensure that excellent filtering at low resistance are achieved.

All equipment must be equipped with expansion and flexible joints to ensure that vibrations are not transferred into the system either as noise and vibrations, expansions and contractions do not damage pipes and connections resulting in leakage. For primary (heavy duty) systems ICV's stainless steel expansion joints are recommended (ICV911 series)

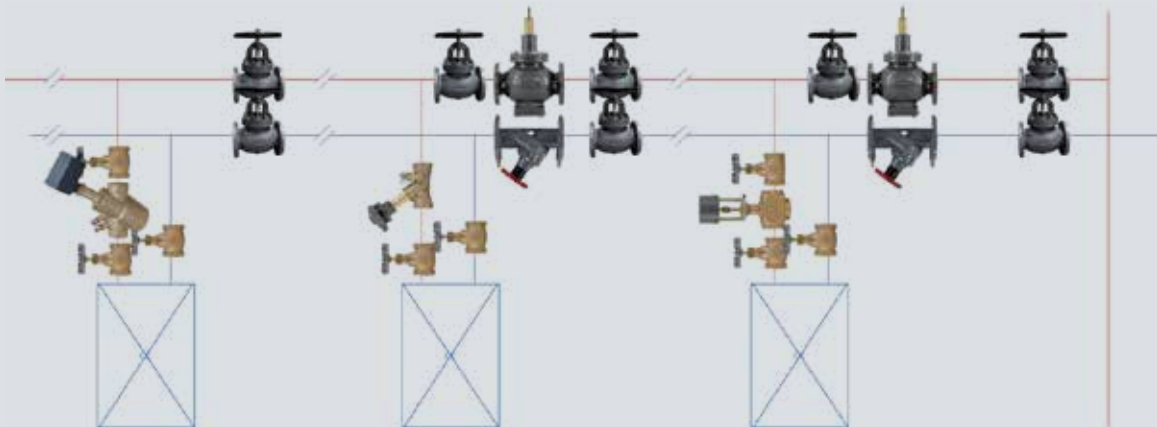
ICV's recommended ranges for data center and chiller stations are ductile iron and carbon steel with durable cross linked epoxy coating for excellent protection against corrosion. And all valves are tested from factory.



# Closed control

## Examples of recommended valve solution for water-to-air closed control equipment

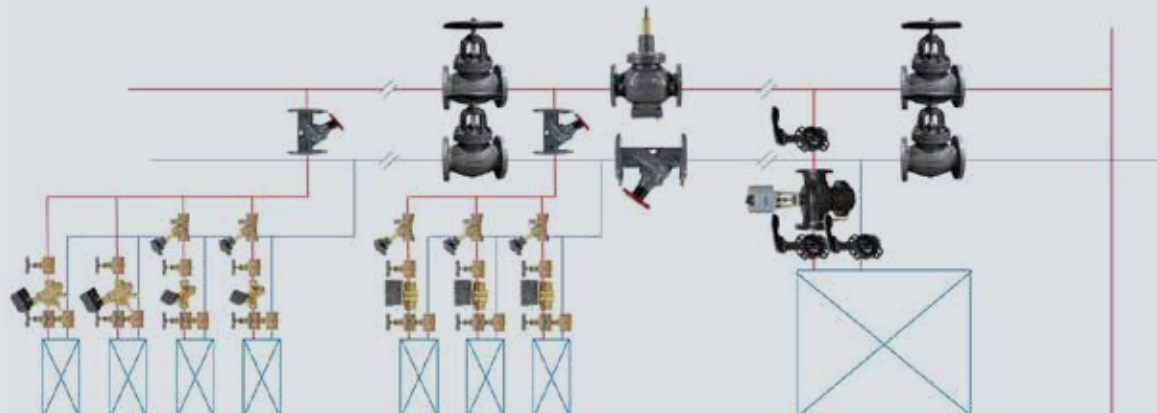
For water based closed control typically redundancy is required and it may be with motorized control in which case both static and dynamic balancing is required (i.e. ICV951 PICV or ICV90803 differential pressure balancing valves); or without as in the case of some computer rooms at least static balancing is also required. Shut-off valve before and after each equipment and control valves are required



# Air-conditioning

## Examples of recommended valve solution standard office cooling

For office, hallways and other areas standard air-condition installations apply. ICV recommend auto-balancing on-off solution using 955 Flowmaster® FC for fan-coils, or the 3-in-1 pressure independent motorized control valve Flowmaster® PICV for fan-coils and air-handling units for optimal control and balancing at the equipment level. For area level balancing the 908/03 differential pressure control valve is also recommended. Shut-off valve before and after each equipment and control valves are required



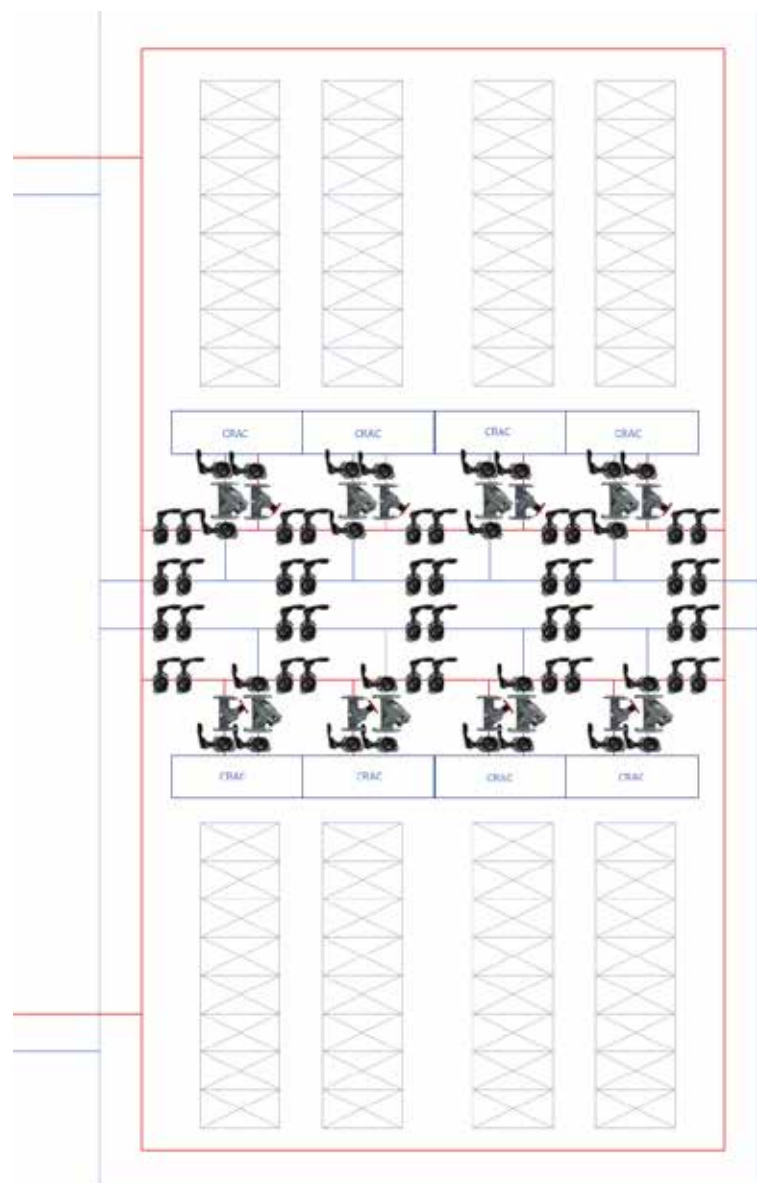


# Computer room

## Example of valve solution for computer room energy distribution typically with piping in trenches with redundancy for safety reasons

For water based cooling in computer rooms, primary consideration is given to safety in terms of stable energy supply, redundancy, and physical separation of electronic equipment from water pipes in trenches or separate rooms.

For modulating demand based energy control we recommend 3-in-1 Flowmaster® pressure independent control valves (PICV) to ensure full valve authority and reliable dynamic and static balancing to each equipment separately. If no modulating control is used (as in this example) as a minimum static balancing (ICV908) is required. Other safety like strainer to protect the CRAC's against debris, and high quality close off valves with a reliable EPDM rubber quality is required.





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