

Your strong partner
with global experience



*Maracana Stadium,
Rio de Janeiro*

Our control and balancing valves delivered energy efficient indoor climate in Brazil's largest stadium with cooling capacity of 10,6 MW.



*Gardens by the bay,
Singapore*

IMI TA valves ensure accurate temperature control without compromising on energy efficiency for over 93,000 plants of more than 1,160 species.



January 2015

Control & balancing PRODUCT GUIDE



Burj Khalifa Tower, Dubai

The world's tallest building, 828 meters, 160 storeys, 8 000 IMI TA valves, commissioned by IMI Hydronic Engineering.



ALMA Belgium, hospital

This new hospital will house 512 beds, total area of 55,000 m². TA-FUSION control valves will create indoor comfort, quiet operation and high energy efficiency. Opening 2017.

www.imi-hydronic.com

IMI Hydronic Engineering

PRODUCT GUIDE



Control & balancing

*Engineering
GREAT Solutions*



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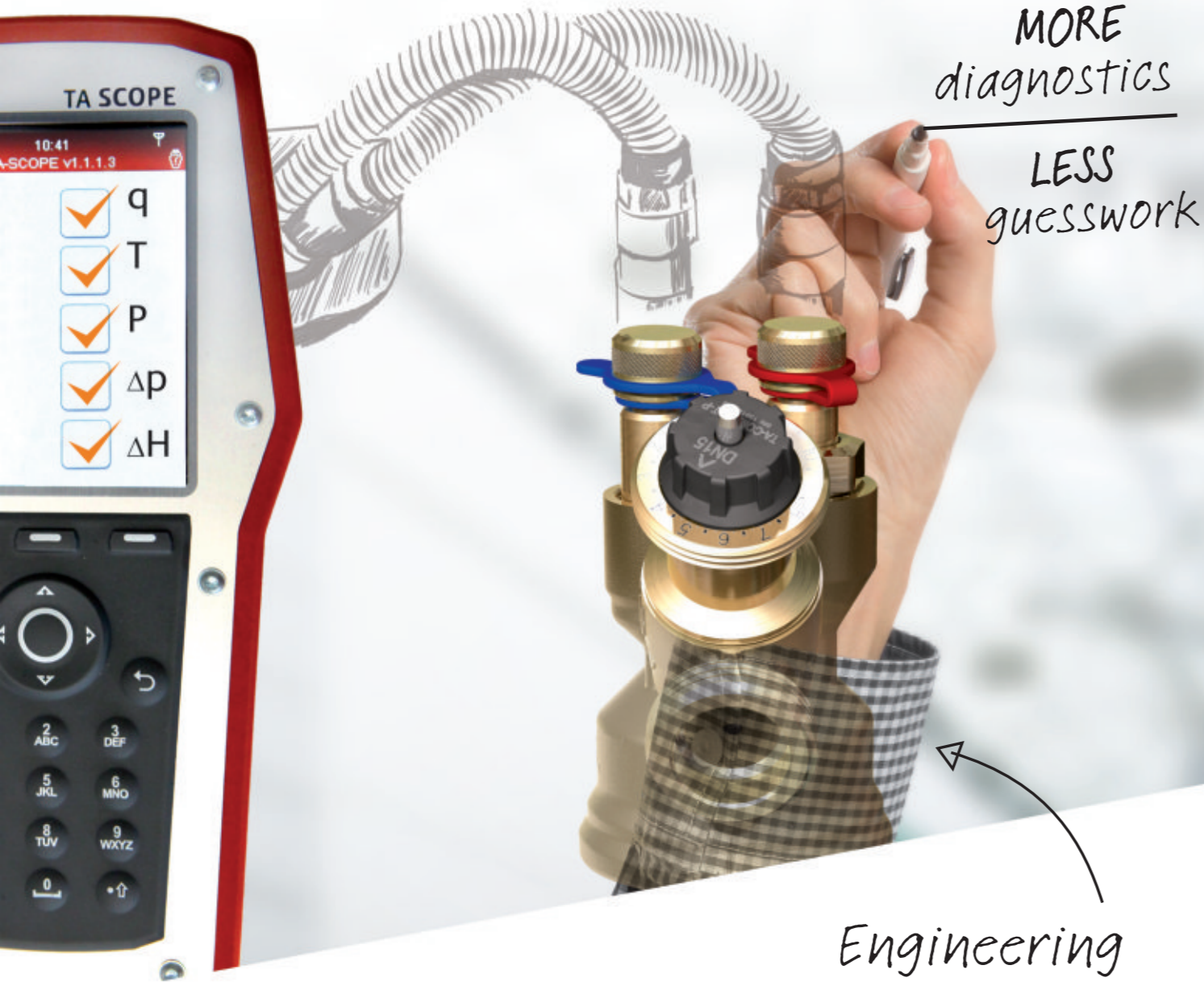
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TA-COMPACT-P

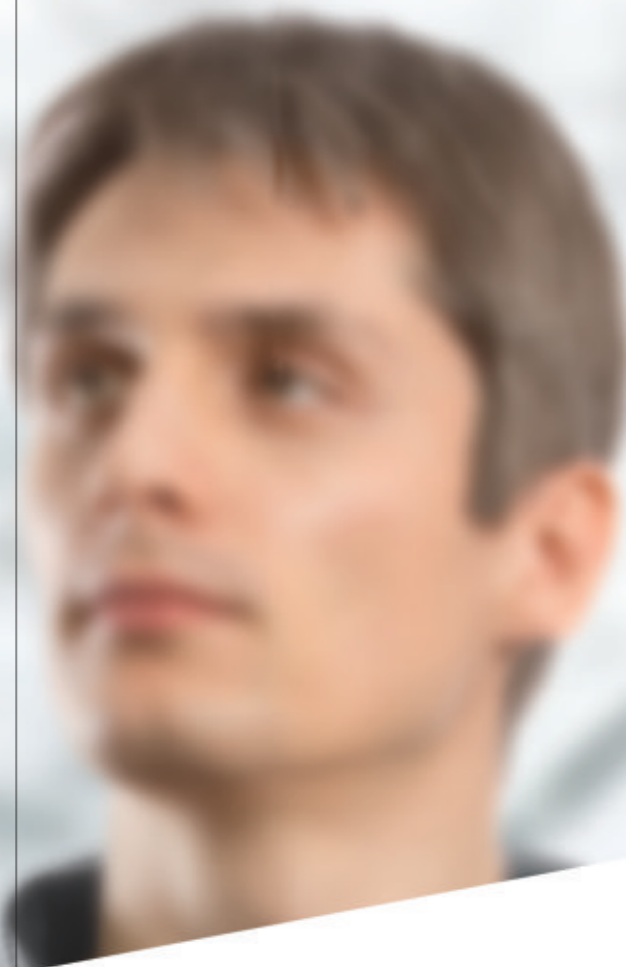


MORE diagnostics
LESS guesswork

Engineering GREAT Solutions

TAKE CONTROL OF YOUR COMFORT

TA-FUS10N



Fully adjustable Kvs
precise control no complaints



HYDRONIC CONTROL YOU CAN MEASURE

The best energy efficiency can be achieved only when all processes inside the system are measurable and transparent.

True system parameters and also possible system failures can be found only by precise and reliable measuring procedures.

enabling you to measure flow, pressure drop, temperatures and even actual power.

Thus, all our combined balancing and control valves are equipped by measuring points

Patented features like fully adjustable Kvs, flushing, ability to measure available pump head differentiates us from the others.

CONTROL VALVES AND ACTUATORS

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Pressure independent balancing and control valves

5 in 1 concept

Pressure independent balancing and control valves are the ideal solution for modern heating and cooling systems requiring low operating costs, easy and flexible installation. Valves provide a stable and precise temperature control under all working conditions due to the integrated differential pressure controller that keeps constant differential pressure over the control part. Fully open valves limit maximal flow and ensure hydraulic balancing.

Our valves are unique on the market, you can benefit from excellent diagnostic and measuring features that help you set the working point of pumps, save maximum energy and find possible system failures.

YOUR BENEFITS

- 5 in 1: control + balancing + diagnostics + Dp control + shut-off
- The best diagnostics possibilities on the market
- Small pressure drop, energy efficient and quiet operation
- High quality and longevity

KEY TECHNICAL PARAMETERS

A1 Pressure independent balancing and control valves	PN	Min. temp.	Max. temp.	Max. Dp	Control	Dimensions													
	bar	°C	°C	bar	characteristics	10	15	20	25	32	40	50	65	80	100	125	150	200	
TBV-CMP	16	-20	120	3.5	EQM		✓	✓	✓										
TA-COMPACT-P	16	0	80	4	LIN	✓	✓	✓	✓	✓									
TA-FUSION-P	16	-20	120	8	EQM					✓	✓	✓							
TA-FUSION-P	16/25	-20	120	8	EQM								✓	✓	✓	✓	✓		
KTM 512	16/25	-10	120/150	16	EQM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
KTM 50	16/25	-10	150	16	EQM										✓	✓	✓	✓	

FUNCTIONS

A1 Pressure independent balancing and control valves	Control	Max flow pre-setting	Differential pressure control	Shut-off	Flushing	Measuring				
						Flow	Pressure drop	Temperature	Available differential pressure	Power
TBV-CMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TA-COMPACT-P	✓	✓	✓	✓		✓	✓	✓	✓	✓
TA-FUSION-P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
KTM 512	✓	✓	✓	✓		✓	✓	✓		✓
KTM 50	✓	✓	✓	✓						

TBV-CMP



- Flow range up to 1 330 l/h
- Perfect solution for modulating control
- Unique flushing function (possibility to deactivate Dp controller)
- Actuator connection M30x1,5
- Enables total system diagnostics
- Made from patented alloy Ametal®

Suitable actuators page 11

TA-COMPACT-P



- Flow range up to 4 000 l/h
- Very compact, slim and practical valve for small terminal units
- Easy access to all its functions from one side
- Actuator connection M30x1,5
- Enables total system diagnostics
- Linear characteristics, best suited for on/off control
- Made from patented alloy Ametal®

Suitable actuators page 11

NEW

TA-FUSION-P



- Flow range up to 207 m³/h
- The best solution for modulating control in HVAC systems
- Extensive range of actuators
- Enables total system diagnostics
- Unique flushing function (possibility to deactivate Dp controller)

Suitable actuators page 14

KTM 512



- Flow range up to 66,8 m³/h
- Ideal solution for systems with high temperature and pressure changes (District energy)
- Wide range of actuators and adapters
- In-line design for quiet operation with high resistance to cavitation

Suitable actuators page 14

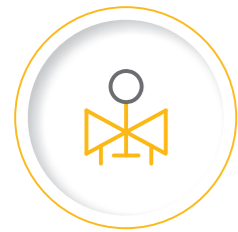
KTM 50



- Flow range up to 215 m³/h
- Ideal control valve for modulating control in district energy systems
- Wide range of actuators and adapters
- High resistance against corrosion

Suitable actuators page 14

See applications **D1** **D7**



Combined balancing and control valves

KEY TECHNICAL PARAMETERS

A2 Combined balancing and control valves	PN	Min. temp.	Max. temp.	Max. Dp	Control	Dimensions											
	bar	°C	°C	bar	characteristics	10	15	20	25	32	40	50	65	80	100	125	150
TBV-C	16	-20	120	9.7 ¹	LIN ⁴	✓	✓	✓									
TBV-CM	16	-20	120	9.7 ¹	EQM	✓	✓	✓									
TA-COMPACT-T ²	16	-10	50	2	LIN	✓	✓	✓									
TA-FUSION-C ³	16	-20	120	3.5	EQM					✓	✓	✓					
TA-FUSION-C ³	16/25	-20	120	4	EQM								✓	✓	✓	✓	✓

1 According to DN and type of actuator
 2 Only for cooling systems
 3 Fully adjustable Kvs, inherent valve characteristics
 4 Ideal for On-Off control

FUNCTIONS

A2 Combined balancing and control valves	On-off control	3-point control	Modulating control	Pre-setting	Shut-off	Measuring				
						Temperature	Flow	Pressure drop	Available differential pressure	Power
TBV-C	✓			✓	✓	✓	✓	✓	✓	✓
TBV-CM		✓	✓	✓	✓	✓	✓	✓	✓	✓
TA-COMPACT-T	✓			✓	✓	✓				
TA-FUSION-C		✓	✓	✓	✓	✓	✓	✓	✓	✓

4 in 1 concept

IMI TA combined balancing and control valves have all the advantages of control and balancing valves built in one body. They dramatically reduce the required number of valves by decreasing installation time and costs. All our combined balancing and control valves are equipped with measuring nipples providing extensive diagnostic functions for hydronic balancing and easy commissioning. A wide variety of control characteristics and actuators offer unique range for different applications.

YOUR BENEFITS

- 4 in 1: control + balancing + diagnostics + shut-off
- Faster and cheaper installation
- Modulating, 3-point or On-Off control possible
- High energy efficiency and low pumping costs

TBV-C



- Ideal valve for On-Off control of small terminal units
- Actuator connection M30x1,5
- Lift independent of Kv pre-setting
- Made from patented alloy Ametal[®]

Suitable actuators page 11

TBV-CM



- EQM characteristics for precise modulating control
- Lift independent of Kv pre-setting
- Actuator connection M30x1,5
- Made from patented alloy Ametal[®]

Suitable actuators page 11

TA-COMPACT-T



- The only on/off control valve with built in return temperature control on the market
- Only for cooling systems, ideal solution for renovation
- Guarantees requested return temperature from terminal units
- Limits overflow by means of return temperature control
- On-Off control valve modulating flow saves a vast amount of pumping energy
- Improves energy efficiency of the entire cooling system

Suitable actuators page 11

See applications **D2** **D8**

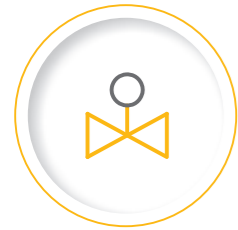
TA-FUSION-C



- Patented fully adjustable Kvs
- Precise valve sizing, easy adaptation to real system conditions
- Inherent EQM characteristics
- Valve lift independent on Kvs pre-setting
- Made from patented alloy Ametal[®]

Suitable actuators page 14

See applications **D10**



Control valves

KEY TECHNICAL PARAMETERS

A3 Standard control valves	PN	Min. temp.	Max. temp.	Max. Dp	Control	Dimensions															
	bar	°C	°C	bar	characteristics	15	20	25	32	40	50	65	80	100	125	150	200	300	350		
HVAC	CV 216/316 MZ	16	0	120	0,6 ¹	EQM/ EQM-LIN ²	✓	✓	✓												
	CV 216/316 RGA	16	-15	150	1,6 ¹	EQM/ EQM-LIN ²	✓	✓	✓	✓	✓	✓									
	CV206/216 GG, CV306/316 GG	6/16	-10	150	1,6 ¹	EQM/ EQM-LIN ²	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
INDUSTRIAL	CV 216/316	16	0 (-30 ¹)	180 (350) ³	1,6 ¹	EQM/ EQM-LIN ²	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CV 225/325	16/25/40	0 (-30 ¹)	180 (350) ³	4,0 ¹	EQM/ EQM-LIN ²	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CV 240/340 S, E	16/25/40	0 (-30 ¹)	180 (350) ³	4,0 ¹	EQM/ EQM-LIN ²	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DR 16 EVS	6/16	-10	110	1,6 ¹	Quick opening	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DR 16 EVSA/EVSR	6/16	-10	110	1,6 ¹	Quick opening	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

1 According to DN and type of actuator
 2 3-way control valves, EQM in direction A-AB, LIN in direction B-AB
 3 Higher temperature available with special accessories
 4 On request

CV 2xx = 2-way valves
 CV 3xx = 3-way valves

Full range from one supplier

Product portfolio of HVAC control valve includes electrically operated control valves made of brass, bronze and grey cast iron as well as electrically operated butterfly valves. All standard control valves are equipped with our durable and flexible MC linear actuators. The butterfly valves operate with the proven M series quarter-turn actuators.

Industrial control valves guarantee the highest quality and durability in millions of variants, which are optimized for their respective applications. Our standardized electrically operated industrial valves cover pressure stages up to PN 40 and class 300 as well as temperatures up to 400°C and nominal sizes up to DN 300. MC series innovative and durable electrical linear actuators are used.

Product range offers nominal sizes up to DN 600, which are individually tailored to the individual project's specifications.

Our modern actuators fulfill demanding requirements of current building management systems and are fully compatible with input and output control signals. Comprehensive range of actuators for modulating, 3-point, PWM and on/off control is available in all voltage variants with either thermal or motorized drive. You can use a wide range of accessories to extend communication capabilities or increase humidity or temperature resistance. Our modern MC actuator can work with different input signals to help you minimize the number of types required for your project.



CV 216/316 MZ

- Kvs range: 0,25 - 8,0
- Compact valve for 3-point or modulating control of small terminal units
- Automatic coupling between stem and actuator for 100% push and pull thrust
- External threads for fast and easy connection

Suitable actuators page 11



CV 216/316 RGA

- Kvs range: 0,63 - 40
- Ideal valve for 3-point or modulating control of mid sized HVAC applications
- Extensive actuator programme for different closing pressure and actuating time
- Delivered with connection fittings
- Wide range of accessories, silicon free version available

Suitable actuators page 14



CV 206/216 GG, CV 306/316 GG

- Kvs range: 0,63 - 315
- Suitable for wide range of HVAC applications
- Extensive actuator programme for different closing pressure and actuating time
- Tight closed in both end-positions
- Wide range of accessories, silicon free version available

Suitable actuators page 14



CV 240/340 S/E

- Kvs range: 0,16 - 630, special Kvs values available
- Version S: made from cast steel
- Version E: made from stainless steel
- Extensive range of actuators and accessories
- Also suitable for different media on request

Suitable actuators page 14



CV 216/316, CV 225/325

- Kvs range: 2,5 - 1 250, special Kvs values available
- Suitable in building and process engineering for various mediums
- 3-way version can be used as a mixing valve or a diverting valve
- Different body materials for various temperatures and pressures

Suitable actuators page 18



DR 16EVS

- Kvs range: 36 - 4 095
- Suitable for waterborn and low pressure steam systems
- Tight closed in end-position
- Extensive actuator programme for different closing pressure and actuating time

Suitable actuators page 18



DR 16EVSA/EVSR

- Kvs range: 96 -13 500
- EVSA: on-off control
- EVSR: modulating control
- Tight closed in end-position
- Extensive actuator programme for different closing pressure and actuating time

Suitable actuators page 18

See applications **D3** **D9**



HVAC actuators with connection M30x1.5



KEY TECHNICAL PARAMETERS

A4 HVAC ACTUATORS Connection M30x1.5	OPERATION PRINCIPLE	CONTROL	SUPPLY VOLTAGE [V]	INPUT SIGNAL	OUTPUT SIGNAL	STROKE [mm]	CONTROL VALVE COMPATIBILITY
EMO-T	THERMOELECTRIC	ON-OFF/PWM	24 AC/DC, 230 AC	ON-OFF	-	4.7	TBV-C, TBV-CMP, TA-COMPACT-T, TA-COMPACT-P
EMO-TM	THERMOELECTRIC	MODULATING	24 AC	0-10 / 10-0 / 2-10 / 10-2 VDC	-	4.7	TBV-CM, TBV-CMP, TA-COMPACT-P
EMO 1	MOTORIZED	MODULATING	24 AC/DC	0-10 / 10-0 / 10-2 VDC	-	4.5	TBV-CM, TBV-CMP, TA-COMPACT-P
EMO-EIB	MOTORIZED	MODULATING	24 DC	EIB bus	EIB bus	4.2	TBV-CM, TBV-CMP, TA-COMPACT-P
EMO-LON	MOTORIZED	MODULATING	48 DC	LonWorks	LonWorks	4.2	TBV-CM, TBV-CMP, TA-COMPACT-P
EMO 3	MOTORIZED	3-POINT	24 AC	3-POINT	-	4.5	TBV-CM, TBV-CMP, TA-COMPACT-P
EMO 3/230	MOTORIZED	3-POINT	230 AC	3-POINT	-	4.5	TBV-C, TBV-CM, TBV-CMP, TA-COMPACT-P
TA-MC15/24	MOTORIZED	MODULATING/ 3-POINT	24 AC/DC	0(2)-10 VDC, 3-POINT	-	9	CV 216/316 MZ
TA-MC15/230	MOTORIZED	3-POINT	230 AC	3-POINT	-	9	CV 216/316 MZ
TA-MC15/24-C	MOTORIZED	MODULATING /3-POINT	24 AC/DC	0(2)-10 VDC, 3-POINT	-	6	TBV-C, TBV-CM, TBV-CMP
TA-MC15/230-C	MOTORIZED	3-POINT	230 AC	3-POINT	-	6	TBV-C, TBV-CM, TBV-CMP
TA-MC50/24-C	MOTORIZED	MODULATING/ 3-POINT	24 AC/DC	0(2)-10 VDC, 3-POINT	-	10	KTM 512 DN 15-50
TA-MC50/230-C	MOTORIZED	3-POINT	230 AC	230V	-	10	KTM 512 DN 15-50

RECOMMENDED COMBINATIONS WITH VALVES

A4 HVAC ACTUATORS Connection M30x1.5	TBV-C DN15-25	TBV-CM DN15-25	TBV-CMP DN15-25	TA-COMPACT-T DN15-25	TA-COMPACT-P DN10-32	KTM 512 DN15-50	CV216/316 MZ DN15-25
EMO-T	✓		✓	✓	✓		
EMO-TM		✓	✓		✓		
EMO 1		✓	✓		✓		
EMO-EIB		✓	✓		✓		
EMO-LON		✓	✓		✓		
EMO 3		✓	✓		✓		
EMO 3/230		✓	✓		✓		
TA-MC15/24							✓
TA-MC15/230							✓
TA-MC15/24-C	✓	✓	✓				
TA-MC15/230-C	✓	✓	✓				
TA-MC50/24-C						✓	
TA-MC50/230-C						✓	



EMO-T

- Visible position indicator
- High IP54 protection class
- Works in all installation positions
- Connection M30x1,5
- Adjusting force 125N

On-Off control



EMO-TM

- Visible position indicator
- Auto-adaptation to control voltage according to wiring
- Automatic stroke adjustment
- High IP54 protection class
- Works in all installation positions
- Connection M30x1,5
- Adjusting force 125N

Modulating control



EMO 1

- Automatic stroke adjustment
- Low-noise operation
- Low energy consumption
- Connection M30x1,5
- Adjusting force 160N

Modulating control



EMO-EIB

- For EIB® networks
- LED indicator
- Automatic stroke adjustment
- Low-noise operation
- Connection M30x1,5
- Adjusting force 160N

Modulating control



EMO LON

- For LONWORKS® networks
- LED indicator
- Automatic stroke adjustment
- Low-noise operation
- Connection M30x1,5
- Adjusting force 160N

Modulating control



EMO 3

- Automatic stroke adjustment
- Low-noise operation
- Low energy consumption
- Connection M30x1,5
- Adjusting force 160N

3-point control



TA-MC15

- For CV 216/316 MZ control valves
- Automatic stroke adaptation
- Auto connection system to valve stem
- Position indicator
- Low power consumption
- Adjusting force 150N

Modulating or 3-point control



TA-MC15-C

- For spring loaded control valves
- Connection M30x1,5
- Automatic stroke adaptation
- Position indicator
- Low power consumption
- Adjusting force 200N

Modulating or 3-point control



TA-MC50-C

- For spring loaded control valves KTM 512 DN 15-50
- Connection M30x1,5
- Automatic stroke adaptation
- Position indicator
- Low power consumption
- Adjusting force 500N

Modulating or 3-point control



HVAC actuators – fixed connection with valve stem

COMBINATIONS WITH CONTROL VALVES

A5 HVAC ACTUATORS Fixed connection with valve stem	KTM 512	KTM 50	TA-FUSION-C				TA-FUSION-P				CV 216/ 316 RGA	CV 206/306 GG			CV 216/316 GG						
	DN 15-125	DN 100 -200	DN 32-50	DN 65 80	DN 100 125	DN 150	DN 32 -50	DN 65 80	DN 100 125	DN 150	DN 15-50	DN 15-50	DN 65	DN 80	DN 100	DN 15-50	DN 65	DN 80	DN 100	DN 125	DN 150
TA-MC55	✓ ¹		✓	✓			✓	✓			✓	✓			✓						
TA-MC65													✓ ³			✓					
TA-MC100	✓ ¹	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓ ³		✓	✓ ³					
TA-MC100 FSE/FSR	✓	✓	✓	✓	✓	✓ ⁸	✓	✓	✓	✓	✓	✓			✓						
TA-MC160	✓ ¹	✓				✓				✓			✓ ⁴	✓		✓ ⁴	✓		✓ ⁴	✓	
TA-MC161										✓ ²		✓ ³				✓					
TA-MC250													✓ ⁴	✓		✓ ⁴	✓	✓	✓		
TA-MC400													✓ ⁴	✓		✓ ⁴	✓	✓	✓		
TA-MC500													✓ ⁴	✓		✓ ⁴	✓	✓	✓		
TA-MC1000																					✓

1 For KTM 512 DN 65-125 other actuators may be required depending upon the maximum static inlet pressure in the system. Please see full KTM 512 datasheet selection table for further details.
 2 For DN 32-50
 3 For valves with 20 mm stroke
 4 For valves with 30 mm stroke
 5 For DN 40-50
 6 Voltage 115 VAC available
 7 Output signal 0(4)-20mA available as accessory
 8 Max. differential pressure 3,5 bar

KEY TECHNICAL PARAMETERS

A5 HVAC ACTUATORS Fixed connection with valve stem	OPERATION PRINCIPLE	FAIL SAFE	SUPPLY VOLTAGE [V]	INPUT SIGNAL	OUTPUT SIGNAL	STROKE [mm]
TA-MC55/24	3-POINT	-	24 AC, 24 DC	3-POINT	0-10 VDC	20
TA-MC55/230 ⁶	3-POINT	-	230 AC	3-POINT	0-10 VDC	20
TA-MC55Y	MODULATING	-	24 AC, 24 DC	0(2)-10 VDC/0(4)-20 mA	0-10 VDC	20
TA-MC65/24	3-POINT	-	24 AC, 24 DC	3-POINT	0-10 VDC	20
TA-MC65/230 ⁶	3-POINT	-	230 AC	3-POINT	0-10 VDC	20
TA-MC65Y	MODULATING	-	24 AC, 24 DC	0(2)-10 VDC/0(4)-20 mA	0-10 VDC	20
TA-MC100/24	MODULATING/3-POINT	-	24 AC, 24 DC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	20
TA-MC100/230 ⁶	MODULATING/3-POINT	-	230 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	20
TA-MC100 FSE/FSR	MODULATING/3-POINT	YES	24 AC, 24 DC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC / 0(4)-20 mA	20
TA-MC100 FSE/FSR	MODULATING/3-POINT	YES	230 AC	3-POINT	0-10 VDC	20
TA-MC160/24	MODULATING/3-POINT	-	24 AC, 24 DC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	30
TA-MC160/230 ⁶	MODULATING/3-POINT	-	230 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	30
TA-MC161/24	MODULATING/3-POINT	-	24 AC, 24 DC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	20
TA-MC161/230 ⁶	MODULATING/3-POINT	-	230 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	20
MC250/24	MODULATING/3-POINT	-	24 AC, 24 DC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	50
MC250/230 ⁶	MODULATING/3-POINT	-	230 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	50
MC400/24	MODULATING/3-POINT	-	24 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	60
MC400/230 ⁶	MODULATING/3-POINT	-	230 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	60
MC500/24	MODULATING/3-POINT	-	24 AC, 24 DC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	60
MC500/230 ⁶	MODULATING/3-POINT	-	230 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	60
MC1000/24	MODULATING/3-POINT	-	24 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	60
MC1000/230 ⁶	MODULATING/3-POINT	-	230 AC	0(2)-10 VDC/0(4)-20 mA 3-POINT	0-10 VDC ⁴ 7	60



HVAC actuators – fixed connection with valve stem



TA-MC55, TA-MC65

- Automatic stroke adaptation
- Min-Max position indicators
- Binary signal for frost protection function
- Blockage detection
- Different actuating times
- Manual mode
- Low power consumption
- Adjusting force 600N

Modulating or 3-point control



TA-MC 100

- 24V version enables modulating or 3-point control (switch)
- Automatic stroke adaptation
- Min-Max position indicators
- Binary signal for frost protection function
- Blockage detection
- Wire breakage detection
- Adjustable hysteresis for input signal
- Different actuating times
- Manual mode
- Low power consumption
- Adjusting force 1000N

Modulating or 3-point control



TA-MC 100 FSE/FSR

- Visible switch to test fail-safe function
- TA-MC100FSE: Stem extended on power failure
TA-MC100FSR: Stem retracted on power failure
- Automatic stroke adaptation
- Min-Max position indicators
- Binary signal for frost protection function
- Blockage detection
- Wire breakage detection
- Protection against input signal oscillations
- Manual mode
- Low power consumption
- Adjusting force 1000N

Modulating or 3-point control



TA-MC160, TA-MC161

- 24V version enables modulating or 3-point control (switch)
- Automatic stroke adaptation
- Min-Max position indicators
- Binary signal for frost protection function
- Blockage detection
- Wire breakage detection
- Adjustable hysteresis for input signal
- Different actuating times
- Manual mode
- Low power consumption
- Adjusting force 1600N

Modulating or 3-point control

MC 250, 400, 500, 1000

- Automatic stroke adaptation
- Min-Max position indicators
- Binary signal for frost protection function
- Blockage, wire breakage and lock detection
- Overheating protection
- Internal temperature monitoring
- Automatic actuator heating
- Open circuit detection
- Adjustable hysteresis for input signal
- Different actuating times
- Autopause to avoid control hunting
- Manual mode
- Low power consumption
- Adjusting force:
 - MC 250 2.5 kN
 - MC 400 4 kN
 - MC 500 5 kN
 - MC 1000 10 kN

Modulating or 3-point control



Industrial actuators

RECOMMENDED COMBINATIONS WITH VALVES

A6 INDUSTRIAL ACTUATORS for standard control valves	CV 216/316	CV 225/325	CV 240/340 S/E
	DN15-300	DN 15-200	DN 15-300
MC103	✓	✓	✓
MC163	✓	✓	✓
MC253	✓	✓	✓
MC403	✓	✓	✓
MC503	✓	✓	✓
MC1003	✓	✓	✓
MC1503	✓	✓	✓

A6 INDUSTRIAL ACTUATORS for butterfly valves	DR 16 EVS	DR 16 EVSA/EVSR
	DN 25-200	DN 50-350
M125	✓	✓
M135	✓	✓
M140	✓	✓
M150	✓	✓
M180	✓	✓

Special actuators on request (OA6, OA8, OAP8, AS18, ASP25, AS50)

Please contact our hydronic specialists who will help you design an appropriate solution and select products.



M125-135

- Power supply 230 VAC or 24VAC
- Input signal invertible
- M125 IP43, M135 IP 54
- Accessories: 2 potential free adjustable switches

3-point control



M140-180

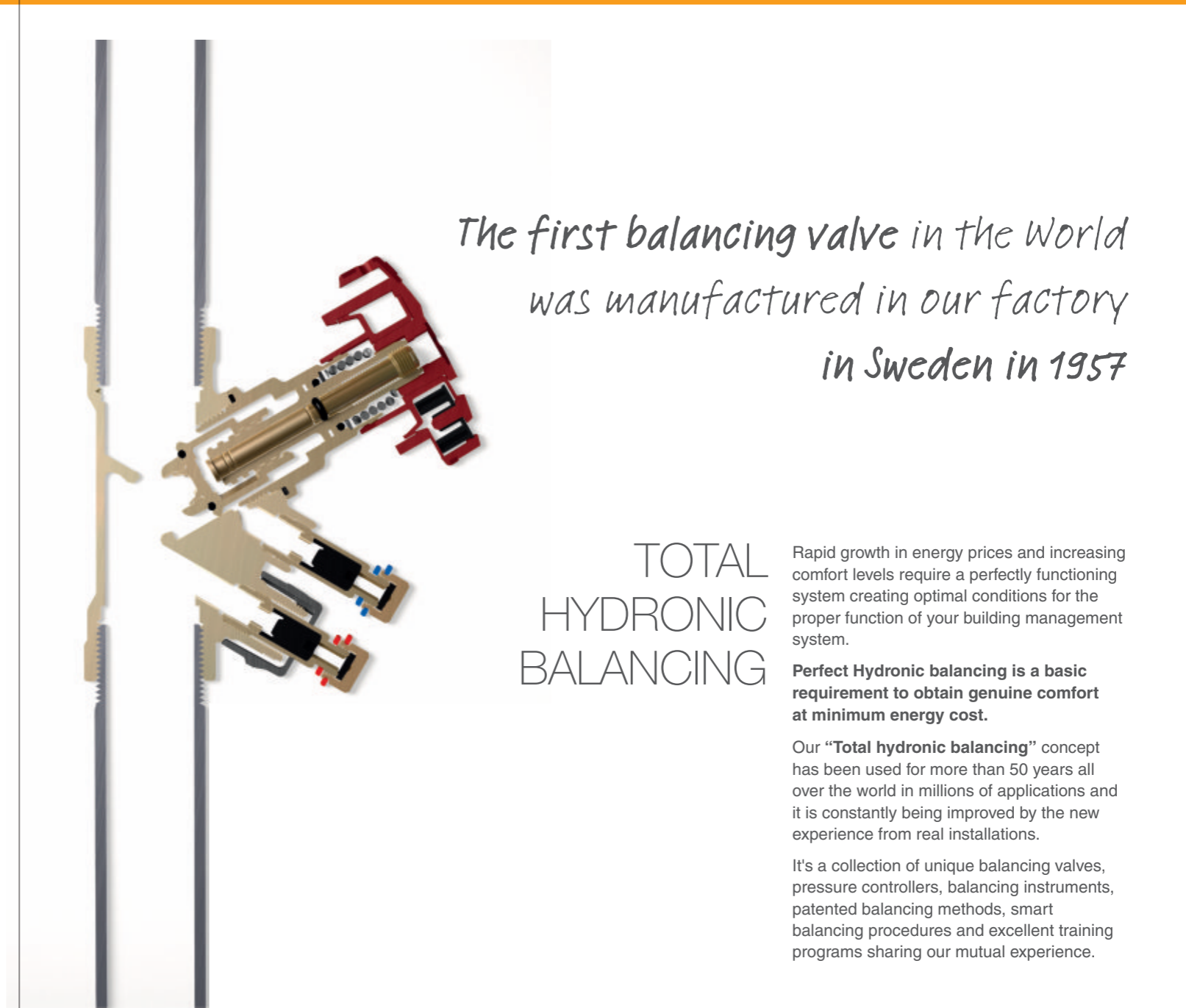
- Power supply 230 VAC or 24VAC
- Input signal invertible
- Protection class IP 54
- Accessories:
 - 2 potential free adjustable switches
 - IP 64 or 65

3-point control





Over 4 million reasons every year to measure



The first balancing valve in the World was manufactured in our factory in Sweden in 1957

TOTAL HYDRONIC BALANCING

Rapid growth in energy prices and increasing comfort levels require a perfectly functioning system creating optimal conditions for the proper function of your building management system.

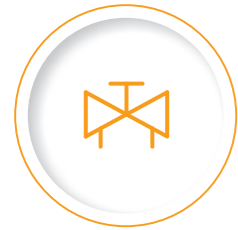
Perfect Hydronic balancing is a basic requirement to obtain genuine comfort at minimum energy cost.

Our “**Total hydronic balancing**” concept has been used for more than 50 years all over the world in millions of applications and it is constantly being improved by the new experience from real installations.

It's a collection of unique balancing valves, pressure controllers, balancing instruments, patented balancing methods, smart balancing procedures and excellent training programs sharing our mutual experience.

TOTAL HYDRONIC BALANCING

B1		Balancing valves	22
B2		Fixed orifices	25
B3		Double regulating fittings	26
B4		Differential pressure controllers	27
B5		Differential pressure relief valves	29



Balancing valves

Full range

Available in sizes DN 10-400, IMI TA balancing valves are used in an impressive range of applications. Ideally suited for use in heating and cooling systems, tap water systems and industry. The STAD and STAF are the most well known balancing valves worldwide.

Absolute certainty

Balancing technology used by our customers has been developed thanks to 50 years of experience from more than 100 000 projects worldwide. Patented balancing methods like TA-Diagnostics and TA-Wireless give you the power and absolute confidence to successfully complete a project of any size. Our patented materials and technology features never disappoint.

Ready for hard work

The range also covers special balancing valves for highly demanding industrial applications working under high temperatures with different liquid mixtures. Such balancing valves are equipped with special measuring points with high protection against leakages to protect the environment and guarantee high safety.

KEY TECHNICAL PARAMETERS

B1 Balancing valves	PN	Min. temp.	Max. temp.	Dimensions																	
	bar	°C	°C	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	
TBV	16	-20	120		✓	✓															
STAD-R	20	-20	120		✓	✓	✓														
STAD	20	-20	120	✓	✓	✓	✓	✓	✓	✓											
STAD-C	20	-20	120/150	✓	✓	✓	✓	✓	✓	✓											
STAD-B	20	-20	120	✓	✓	✓	✓	✓	✓	✓											
STAF	16	-20	120								✓	✓	✓	✓	✓						
STAF-R	16	-20	120								✓	✓	✓	✓	✓						
STAG	25	-20	120								✓	✓	✓	✓	✓	✓	✓	✓	✓		
STAF-SG	16/25	-20	120			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
STAF-SGT	16/25	-20	120/150			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TA-BVS	16/25/40	-30	200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		

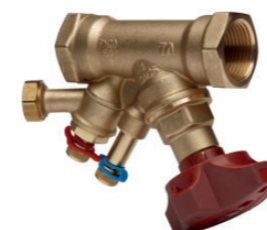
FUNCTIONS

B1 Balancing valves	Balancing	Pre-setting	Measuring	Shut-off	Measuring points	Draining (optional)	Pressure balanced plug
TBV	✓	✓	✓	✓	✓		
STAD	✓	✓	✓	✓	✓	✓	
STAD-B	✓	✓	✓	✓	✓	✓	
STAD-C	✓	✓	✓	✓	✓		
STAD-DR	✓	✓	✓	✓	✓	✓	
STAF	✓	✓	✓	✓	✓		✓
STAF-SG	✓	✓	✓	✓	✓		✓
STAF-SGT	✓	✓	✓	✓	✓		✓
STAG	✓	✓	✓	✓	✓		✓
STAF-R	✓	✓	✓	✓	✓		✓
TA-BVS	✓	✓	✓	✓	✓		



TBV

- Ideal valve for balancing small terminal units
- Compact size
- Full measuring capabilities
- Made from patented alloy Ametal®



STAD

- The most popular balancing valve worldwide
- Excellent measuring accuracy
- Ergonomic handwheel with exact setting indicator
- Optional 1/2" or 3/4" draining
- Made from patented alloy Ametal®



STAD-C

- Special version for high temperature systems up to 150°C
- Double sealed measuring points with high protection against leakages
- External threads or smooth ends for tight and reliable connection
- Made from patented alloy Ametal®

See applications [D3](#) [D4](#) [D5](#) [D6](#) [D9](#) [D10](#) [D11](#) [D12](#)



STAD-R

- Unique balancing valve for renovations with reduced Kvs values
- No need to reduce pipe dimensions; decreases installation costs
- Full measuring possibilities with high accuracy
- Made from patented alloy Ametal®



STAD-B

- Balancing valve for hot tap water systems with special protection against oxygen corrosion
- Certified to be used in systems with drinking water
- Excellent measuring accuracy
- Made from patented alloy Ametal®



STAF, STAF-SG, STAF-SGT

- Pressure balanced plug for easy closing and opening under high differential pressure
- Excellent measuring accuracy with high resolution setting indicator
- Special version for systems operating under high temperatures up to 150°C (SGT)
- Bonet, cone and stem made from dezincification resistant alloy Ametal®



STAG

- Grooved balancing valve for Victaulic system
- Pressure balanced plug for easy closing and opening under high differential pressure
- Excellent measuring accuracy
- Bonet, cone and stem made from patented alloy Ametal®



STAF-R

- Made from bronze with high resistance to corrosion for tap/industrial water systems
- Pressure balanced plug for easy closing and opening under high differential pressure
- Excellent measuring accuracy
- Bonet, cone and stem made from patented alloy Ametal®



TA-BVS

- Stainless steel balancing valve with flanges or welding ends
- Ideal for use mainly in industrial and high temperature applications
- Long life and maintenance free operation
- DN 200 and 250 with manual gear for easy shut-off

See applications [D3](#) [D4](#) [D5](#) [D6](#) [D9](#) [D10](#) [D11](#) [D12](#)



Fixed orifices

Flow measuring orifices with self-sealed measuring points are used for simple flow measuring in heating and cooling systems or systems in industries with constant flow.

The orifice should be installed between two counter flanges. It is recommended to install 10D straight lengths before and 5D straight lengths after the orifice for exact measuring.

Our fixed orifices are made precisely from stainless steel and guarantee longevity and very accurate measuring.

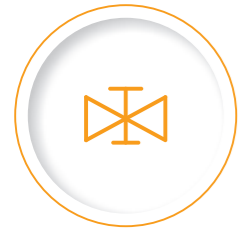
KEY TECHNICAL PARAMETERS

B2 Fixed orifices	PN	Min. temp.	Max. temp.	Dimensions																	
	bar	°C	°C	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500-900	
MDF0	16	-20	120	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MDF0	25	-20	120						✓	✓	✓	✓	✓	✓	✓						
MDF0	40	-20	120						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		



MDF0

- Made from stainless steel
- Suitable for heating/cooling and technology circuits
- Measuring points made from dezincification resistant alloy Ametal®
- Excellent measuring accuracy



Double regulating fittings

KEY TECHNICAL PARAMETERS

B3 Double regulating fittings	PN	Min. temp.	Max. temp.	Dimensions					
	bar	°C	°C	15	20	25	32	40	50
STK	16	-20	120	✓	✓				
STA	25	-20	120	✓	✓	✓	✓	✓	✓

FUNCTIONS

B3 Double regulating fittings	Balancing	Pre-setting	Shut-off	Measuring	Draining (optional)
STK	✓	✓	✓		
STA	✓	✓	✓		✓



STK

- Return lockshield with direct Kv indicator
- Setting with lock ring
- Shut-off function
- Made from nickel-plated patented alloy Ametal®



STA

- Handwheel indicating position of plug with pre-setting
- With draining 1/2" without measuring points
- Made from patented alloy Ametal®



Differential pressure controllers

KEY TECHNICAL PARAMETERS

B4 Differential pressure controllers	PN	Min. temp.	Max. temp.	Max. Dp	Setting range	Dimensions												
	bar	°C	°C	bar	kPa	15	20	25	32	40	50	65	80	100	125	150	200	
STAP	16	-20	120	2.5	5-80	✓	✓	✓	✓	✓	✓							
STAP	16	-10	120	3.5	20-160							✓	✓	✓				
DA 516	16/25	-10	120/150	16	5-150	✓	✓	✓	✓	✓	✓							
TA-PILOT-R	16/25	-20	120/150	8	10-400							✓	✓	✓	✓	✓	✓	✓

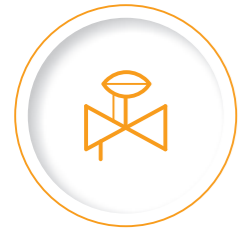
FUNCTIONS

B4 Differential pressure controllers	Return pipe	Supply pipe	Measuring	Shut-off	Draining (optional)
STAP DN 15-50	✓		✓	✓	✓
STAP DN 65-100	✓		✓	✓	✓
DA 516 DN 15-150	✓		✓		✓
DAF 516 DN 15-150		✓	✓		✓
TA-PILOT-R DN 65-200	✓		✓		

DIFFERENTIAL PRESSURE RANGE (KPA)

STAP						DA 516/DAF516						TA-PILOT-R			
DN	5-25	10-40	10-60	20-80	40-160	DN	5-30	10-60	10-100	60-150	100-400	DN	10-50	30-150	80-400
15	✓		✓			15/20	✓	✓	✓	✓		65	✓	✓	✓
20	✓		✓			25/32	✓	✓	✓	✓		80	✓	✓	✓
25			✓			40/50	✓	✓	✓	✓		100	✓	✓	✓
32		✓		✓		65	✓	✓	✓	✓		125	✓	✓	✓
40		✓		✓		80	✓	✓	✓	✓		150	✓	✓	✓
50				✓		100	✓	✓	✓	✓		200	✓	✓	✓
65				✓	✓	125	✓	✓	✓	✓					
80				✓	✓	150 ¹	✓	✓	✓	✓	✓				
100				✓	✓										

¹ Available as DA 516 for installation in return pipe



Differential pressure controllers



STAP DN 15-50

- Ideal DP controller with shut-off function for radiators/air conditioning circuits
- Measuring point for return temperature/pressure measurements
- Draining optional as an accessory, mounting without system draining
- Made from patented alloy Ametal®



STAP DN 65-100

- Ideal Dp controller for secondary circuits in HVAC systems
- Two measuring points for system diagnostics enabling the measurement of temperature and differential pressure
- Special measuring point for capillary connection on STAF is a part of delivery
- Works in all positions



DA 516 / DAF 516

- Patented In-line body for quiet operation under high differential pressures
- Particularly effective in systems with high temperatures and differential pressures
- Highly accurate differential pressure control with very low hysteresis
- Rust protection thanks to the electrophoretically painted ductile iron body
- Small and compact body for easy installation in small spaces
- Easy to insulate
- DAF for use in supply pipe, 2 capillaries



TA-PILOT-R

NEW

- First In-line Dp controller operated by Pilot technology
- The smallest, the lightest and the most accurate Dp control on the market
- Clearly visible setting lockable against tampering
- Measuring points for system diagnostics and exact setting according to system true parameters

See applications [D2](#) [D3](#) [D4](#) [D5](#) [D6](#) [D8](#) [D9](#) [D10](#) [D12](#)



Differential pressure relief valves

Differential pressure relief valves are used in heating and cooling systems to ensure a minimum flow level through the pump, maintaining the desired supply temperature when the system operates at low loads or keeps constant differential pressure for specific circuits with terminal units.

KEY TECHNICAL PARAMETERS

B5 Differential pressure controllers	PN	Min. temp.	Max. temp.	Setting range	Shut-off	Dimensions												
	bar	°C	°C	kPa		15	20	25	32	40	50	65	80	100	125	150	200	
HYDROLUX	10	+5	120	5-50	NO		✓	✓	✓									
BPV	20	-20	120	10-60	YES	✓	✓	✓	✓									
DAB 50	16/25	-10	120	10-250	NO				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PM512	16/25	-10	100	0-1600	NO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



BPV

- Setting scale with protection cap against dirt and tampering
- Shut-off function
- Easy setting by 3mm hexagonal key
- Made from patented alloy Ametal®



HYDROLUX

- Direct setting by handwheel with setting scale
- Low proportional hysteresis
- Very quiet in operation
- Made from corrosion resistant gunmetal



DAB 50

- Special internal geometry
- Quiet operation under high differential pressures
- Protected against corrosion
- Robust valve for demanding applications



PM512

- Pneumatic principle allows adjustable set-point from 0 to 16 bar
- In-line design for quiet operation
- Opens at increasing intel pressure
- Setting dependent on static pressure in the system



Until you can measure something and express it in numbers, you are only beginning to understand.

- Lord Kelvin



TAKE CONTROL OF YOUR SUCCESS



YOUR PROFESIONAL INSURANCE

To describe the real behavior of a system or to turn unexpected operating problems into figures is not a simple task. It requires the right smart tools.

Working together with you on many projects during year is the best way to fully understand your needs.

Hydronic tools were specially tailored for you to simplify your job and above all to save your time and money.

If you run into trouble, you never be alone. You can always rely on our technical support, no matter where you are and how large your project is.

HYDRONIC TOOLS

C1		Balancing instruments	32
C2		Measuring tools	33
C3		Software	34



Balancing instruments



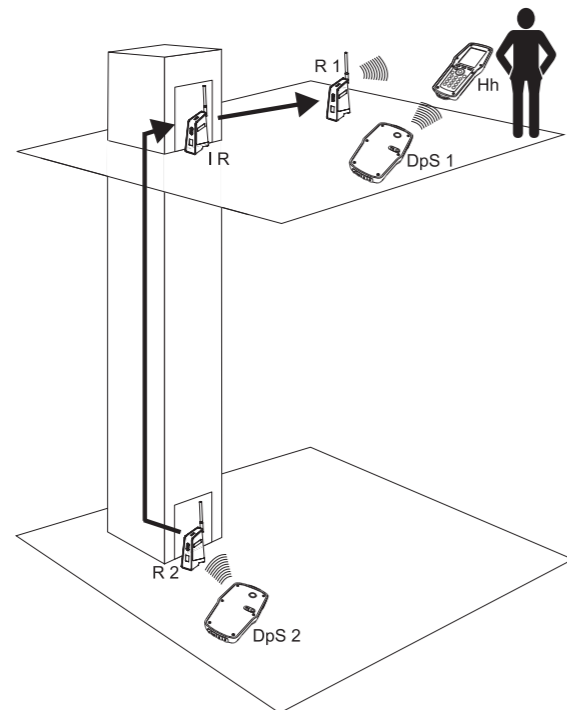
TA-SCOPE

- The most effective balancing instrument for measuring and monitoring of differential pressure, flow, temperature and power in hydronic systems.
- Highly accurate pressure sensor with measuring deviation 0.1 kPa or 1% of reading, whichever is the highest.
- High capacity battery enables more than 25 hours of work with backlight on
- Fast charging: handheld unit 6-7 h, Dp sensor 1,5h
- Logging time more than 100 days, 120 000 measured values
- Wireless or cable communication with sensors
- Extensive range of accessories, free of charge updates
- The powerful TA-Wireless and TA-Diagnostic methods for balancing hydronic systems and time effective troubleshooting procedures
- Differential pressure range:

TA-SCOPE	0 - 200 kPa
TA-SCOPE HP	0 - 1 000 kPa

TA-SCOPE Relay

- Accessory for TA-SCOPE
- Long-range transmission relay for measuring, balancing and diagnosing hydronic systems with multiple TA-SCOPE sensors.
- It is to be used in particular for applying the TA-Wireless method with the TA-SCOPE in large buildings.
- Range in open space: approx. 500 m, indoors: approx. 5-6 floors
- Wireless communication with easy start-up
- Lockable against theft



Measuring tools



TA-LINK

- Provides an accurate measurement of the differential pressure
- The crucial connection between the hydronic system and the building management system (BMS)
- Max. differential pressure 2 or 5 bar, measuring range 0-40 kPa or 0-100kPa
- Output signal 0-10V or 4-20mA





Software



HySelect

HySelect is computer software that:

- selects valves and determines the right valve size and setting
- helps to choose the correct type of actuator and available accessories
- calculates heating and cooling systems, also with diversity factors
- converts different units
- communicates with balancing instrument TA-Scope



HyTools

HyTools is an app packed with hydronic calculation tools. You can have all our products, hydronic calculators and unit conversion tools on your iPhone, iPad, iPod Touch* or Android smartphone.

The HyTools functions include:

- Hydronic calculator: q-Kv-Dp; P-q-DT; q-Valve-Dp
- Zeparo Dp calculation
- Valve sizing and presetting
- Radiator power estimation (steel and cast iron)
- Sizing and presetting of thermostatic valves, balancing valves, Dp controllers and more.
- Pipe sizing
- Unit conversion
- Run-time localisation selection (24 regions)
- Run-time language selection of 16 languages

Download HyTools now from the Apple* App Store or Google Play. With HyTools, everything you need for complex hydronic calculation is just one touch away.



IMI Hecos

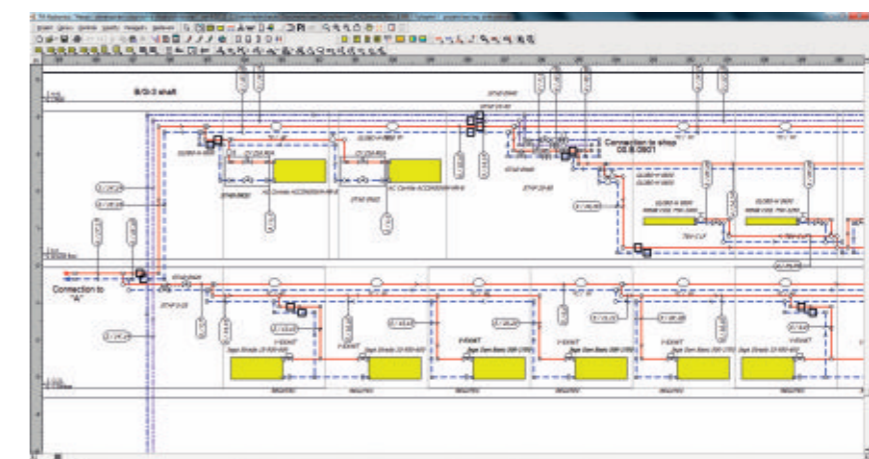
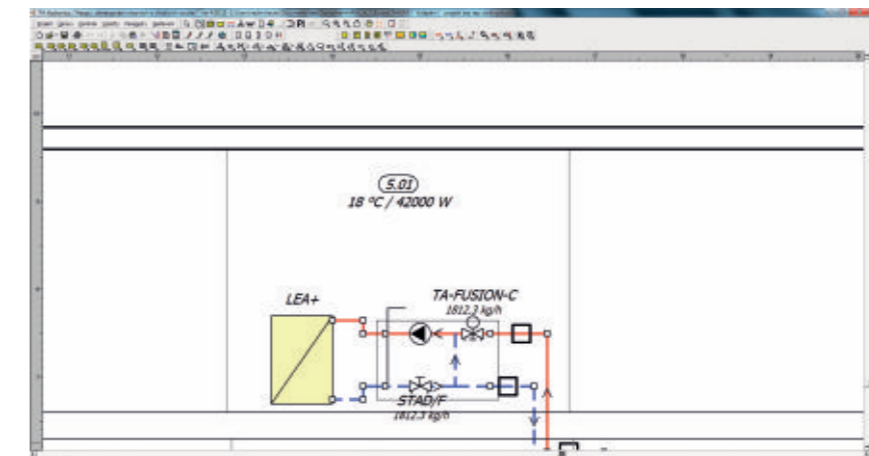
IMI Hecos is a fully graphical computer program that helps you design heating and cooling waterborn systems in the technically correct, most economical and efficient way. It makes it easy to calculate all parts of hydronic loops including terminal units, valves, pumps and pipes.

You just need to describe the building, rooms and temperatures as well as to define what the system should look like.

In return you can get the required pump head, detailed lists of optimally sized components, water volume of the system for further pressurisation unit calculation, full system specification and most importantly, your full plant's scheme to print out or export into CAD program.

- Easy to modify the calculation parameters and retrieve new results.
- Interactive communication between the drawing and result sheets.
- Availability of software application for one pipe radiator systems as well as a reverse return system.
- Joint drawing for the software showing the heating and the cooling network (e.g. 4-pipe fan coil system).
- Glycol correction.

Software is available in English, Chinese, Czech, Estonian, French, German, Hungarian, Italian, Latvian, Lithuanian, Polish, Romanian, Russian, Swedish and Turkish.





TAKE
CONTROL
OF WHERE
YOUR
ENERGY
FLOWS

Applications overview

HEATING SYSTEMS

Type	Solutions	Energy efficiency	Investment
D1 Variable flow	Pressure independent balancing and control valves	low <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high
D2 Variable flow	Combined balancing and control valves	low <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high
D3 Variable flow	Balancing and standard control valves	low <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> high
D4 Variable flow	Thermostatic radiator valves with pre-setting	low <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high
D5 Variable flow	AFC technology (Automatic Flow Control)	low <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high
D6 Constant flow	Balancing and standard control valves	low <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> high

COOLING SYSTEMS

Type	Solutions	Energy efficiency	Investment
D7 Variable flow	Pressure independent balancing and control valves	low <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high
D8 Variable flow	Combined balancing and control valves	low <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high
D9 Variable flow	Balancing and standard control valves	low <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> high
D10 Variable flow	Control valves with return temperature controller	low <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high
D11 Constant flow	Balancing and standard control valves	low <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high	low <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> high

EXTRA

Type	Solutions	Energy efficiency	Investment
D12 Variable flow	Auto-adapting variable flow decoupling circuit	low <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> high	low <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> high

Solution examples show the most used applications in heating and cooling systems.

There are a large number of variants, combinations and unique solutions that are beyond the scope of the contents of this brochure.

Every system has its own specifics with regard to the source of heat or cold, type of control, investment limits etc.

Please do not hesitate to ask our hydronic specialists for help to choose the best solution for your project.

Your success is the greatest reward of our daily work.

Heating system – variable flow

Pressure independent balancing and control valves

ENERGY EFFICIENCY

- Provides stable and precise temperature control under all operating conditions.
- Pressure independent control with high control authority for modulating/3-point control.
- Low pumping energy consumption (no overflows).
- Very small pressure drop of IMI TA valves minimises the demands on pump head.
- Pump head optimisation possible thanks to unique valves diagnostic functions.
- Minimal heat loss on return pipes.

INVESTMENT

- Solution with minimal number of installed valves.
- Cheaper actuators can be used (low closing pressure required).
- Excellent measuring and diagnostic capabilities of IMI TA valves enable full system diagnostics without additional investment in other devices.
- Fast return on investment (premium quality, high longevity, high energy savings).
- High flexibility. Heating system can be constructed gradually without the need to perform hydronic balancing, pump head should be set to the new system demands.



SIZING

- Simple valve sizing according to nominal flow.
- Hydronic calculation based on minimal required differential pressure on reference valve and pressure drop of system during nominal conditions.
- No need to check control valve authority.
- Easy selection of suitable actuator.
- HySelect and IMI Hecos software will help you with hydronic calculations.

COMMISSIONING

- Easy pre-setting of maximal flow on each valve.
- Direct measuring of actual flow and available differential pressure helps you accurately set the minimal required pump head to achieve the highest energy efficiency.
- With the excellent diagnostic capabilities of IMI TA valves, it is easy to find and solve any possible system failures by using TA-Scope.

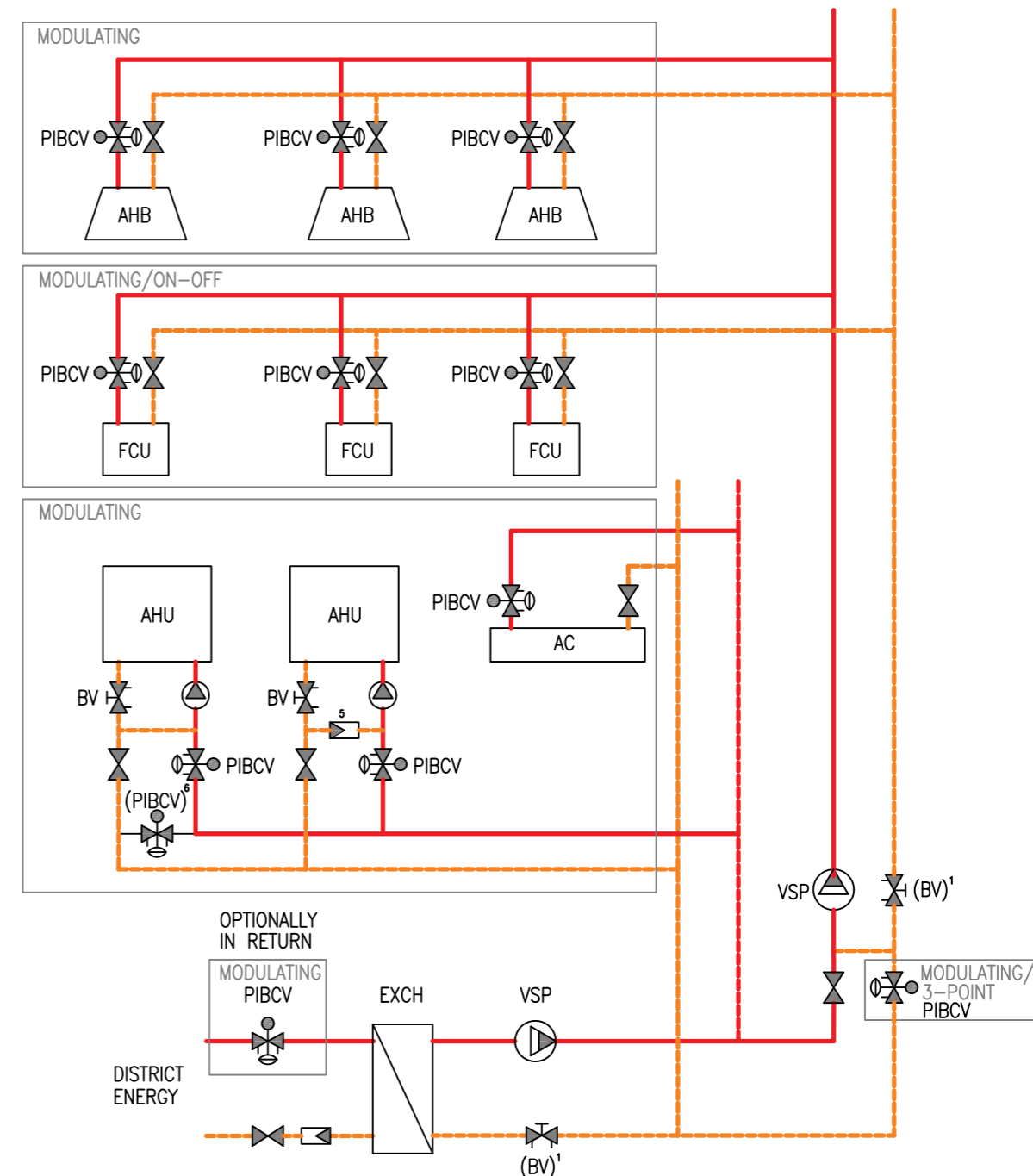
QUICK LINKS

A1		PIBCV Pressure independent balancing and control valves	page 4
B1		BV Balancing valves	page 22

Recommended

Energy efficiency low high

Investment low high



1) Optional/recommended for flow measuring and system diagnostics
 5) Check valve is recommended to protect AHU against freezing up if secondary pump failed
 6) Optional/recommended for maintaining hot water in the supply pipe (without or with actuator, opens when AHU control valve is fully closed)

Legend:

PIBCV	Pressure independent balancing and control valve	VSP	Variable speed pump control
BV	Balancing valve	FCU	Fan-coil
		AHU	Airhandling unit
		AHB	Active heating beam
		AC	Air curtain
		EXCH	Heat exchanger

Heating system – variable flow

Combined balancing and control valves

ENERGY EFFICIENCY

- Provides stable and precise temperature control under all operating conditions.
- Differential pressure controllers on branches help stabilize pressure conditions for modulating valves and maintain good control authority.
- TA-FUSION-C valves with fully adjustable Kvs value always works with high control authority and Dp controllers are not usually needed.
- Low pumping energy consumption.
- Pump head optimisation possible thanks to unique valve diagnostic functions.
- Minimal heat loss on return pipes.
- Under certain conditions, On-Off control can create some overflows during partial load. This phenomenon can be limited during project design.

INVESTMENT

- Recommended solution with good balance between energy efficiency and investment.
- Depending on system structure, this solution is typically cheaper in comparison to D1 although some balancing valves and differential pressures on branches are needed.
- Dp controllers are not needed (lower investment) if TA-FUSION-C with adjustable Kvs are used.
- Excellent measuring and diagnostic capabilities of IMI TA valves enable full system diagnostics without additional investment in other devices.
- Fast return on investment (usually cost effective solution, premium quality products, high longevity).
- High flexibility. Heating system can be constructed gradually without the need to perform hydronic balancing, pump head should be set to the new system demands.

SIZING

- Sizing of the valve according to nominal flow and minimal pressure drop (1/3 of total pressure drop of branch without control valves which is controlled by Dp controller) for good control authority.
- High control authority of TA-FUSION-C thanks to adjustable Kvs, minimal risk of undersizing.
- Actuator closing pressure must be checked.
- We do recommend using pressure independent balancing and control valves for separate small terminal units connected directly to the main pipe to ensure high control authority and limit overflows.
- HySelect and IMI Hecos software will help you with hydronic calculations.

COMMISSIONING

- Easy pre-setting of valves according to hydronic calculation.
- Direct measuring of actual flow and available differential pressure enables to set properly minimal required pump head.
- Flow measuring of individual small control valves in branch possible but not obligatory.
- Freely adjustable Kvs of TA-FUSION-C enables increased control authority when control hunting occurs.
- With the excellent diagnostic capabilities of IMI TA valves, it is easy to find and solve any possible system failures by using TA-Scope.

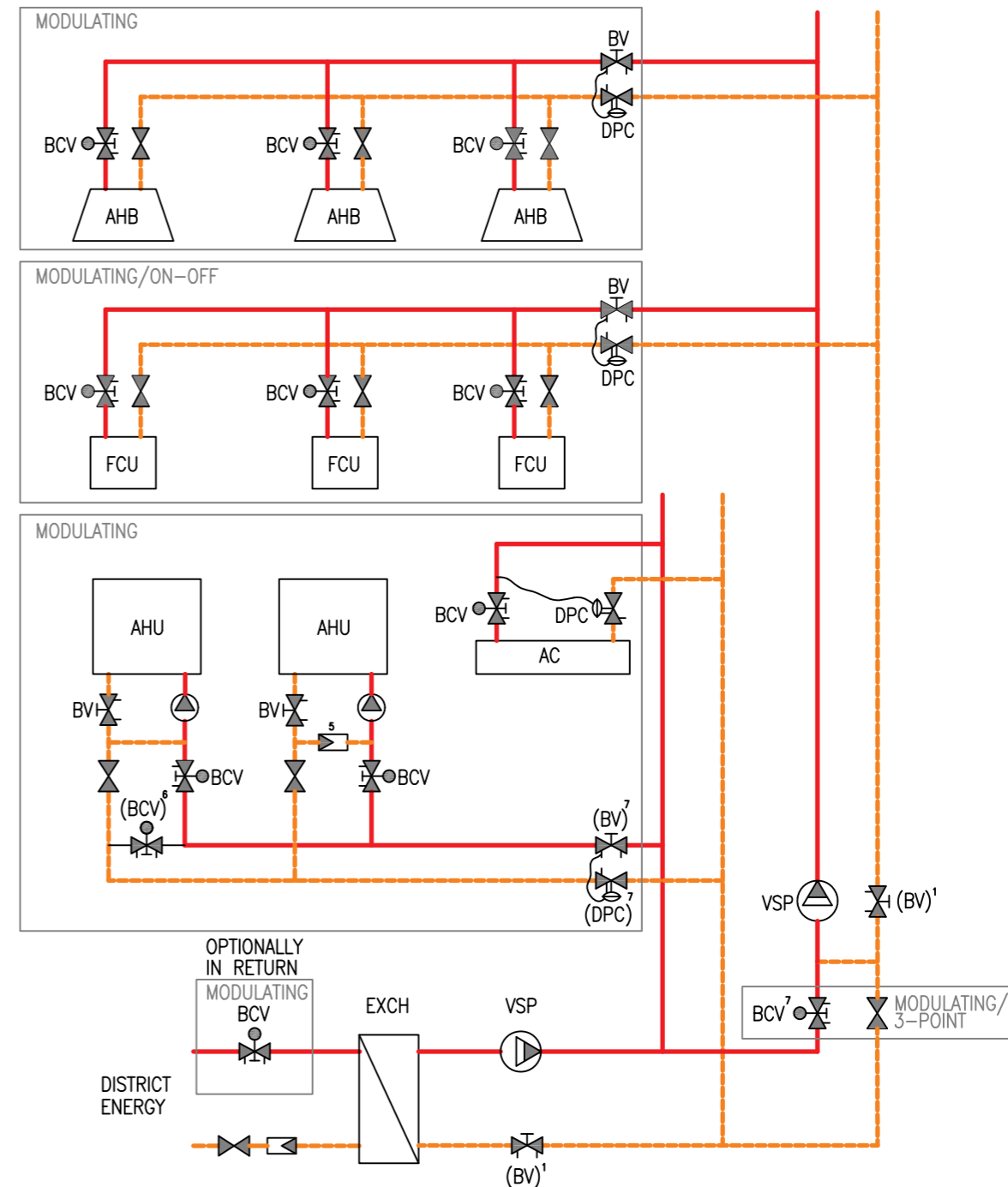
QUICK LINKS

A2		BCV	Combined balancing and control valves	page 6
B1		BV	Balancing valves	page 22
B4		DPC	Differential pressure controllers	page 27

Recommended

Energy efficiency low high

Investment low high



- 1) Optional/recommended for flow measuring and system diagnostics
- 5) Check valve is recommended to protect AHU against freezing up if secondary pump failed
- 6) Optional/recommended for maintaining hot water in the supply pipe (without or with actuator, opens when AHU control valve is fully closed)
- 7) Dp control recommended if control valve authority can drop below 0,25 during system operation due to big changes of differential pressure. Usually not needed for TA-FUSION-C with high control authority thanks to adjustable kvs

Legend:

BCV	Combined balancing and control valve	VSP	Variable speed pump
BV	Balancing valve	FCU	Fan-coil
DPC	Differential pressure controller	AHU	Air handling unit
		AHB	Active heating beam
		AC	Air curtain

Heating system – variable flow

Balancing and standard control valves

ENERGY EFFICIENCY

- Provides stable and precise temperature control under all operating conditions if control valves are properly sized and pressure conditions are under control.
- Differential pressure controllers on branches help stabilize pressure conditions for modulating valves and maintain good control authority.
- Low pumping energy consumption.
- Pump head optimisation possible.
- Minimal heat loss on return pipes.

INVESTMENT

- Higher investment in comparison to solution D2, installation of stand-alone balancing valves.
- Bigger flows require bigger balancing valves and Dp controllers on branches (TA-PILOT-R helps to decrease investment).
- Unique measuring and diagnostic functions on IMI TA valves guarantee minimum energy usage and proper setting of all system components.
- High flexibility. Heating system can be constructed gradually. It is recommended that you finish branches and commission balancing valve and Dp controller to avoid hydronic interactivity.

SIZING

- Control valve sizing according to nominal flow and minimal pressure drop (1/3 of total pressure drop of branch without control valves controlled by Dp controller) to ensure good control authority.
- Closing pressure of actuator must be checked.
- HySelect and IMI Hecos software will help you with hydronic calculations.

COMMISSIONING

- Easy pre-setting of all balancing valves and Dp controllers according to hydronic calculation.
- Dp controllers should be set according to real pressure drop of the branch.
- Use IMI TA balancing methods to find optimal set point of pump.
- With the excellent diagnostic capabilities of IMI TA valves, it is easy to find and solve any possible system failures by using TA-Scope.

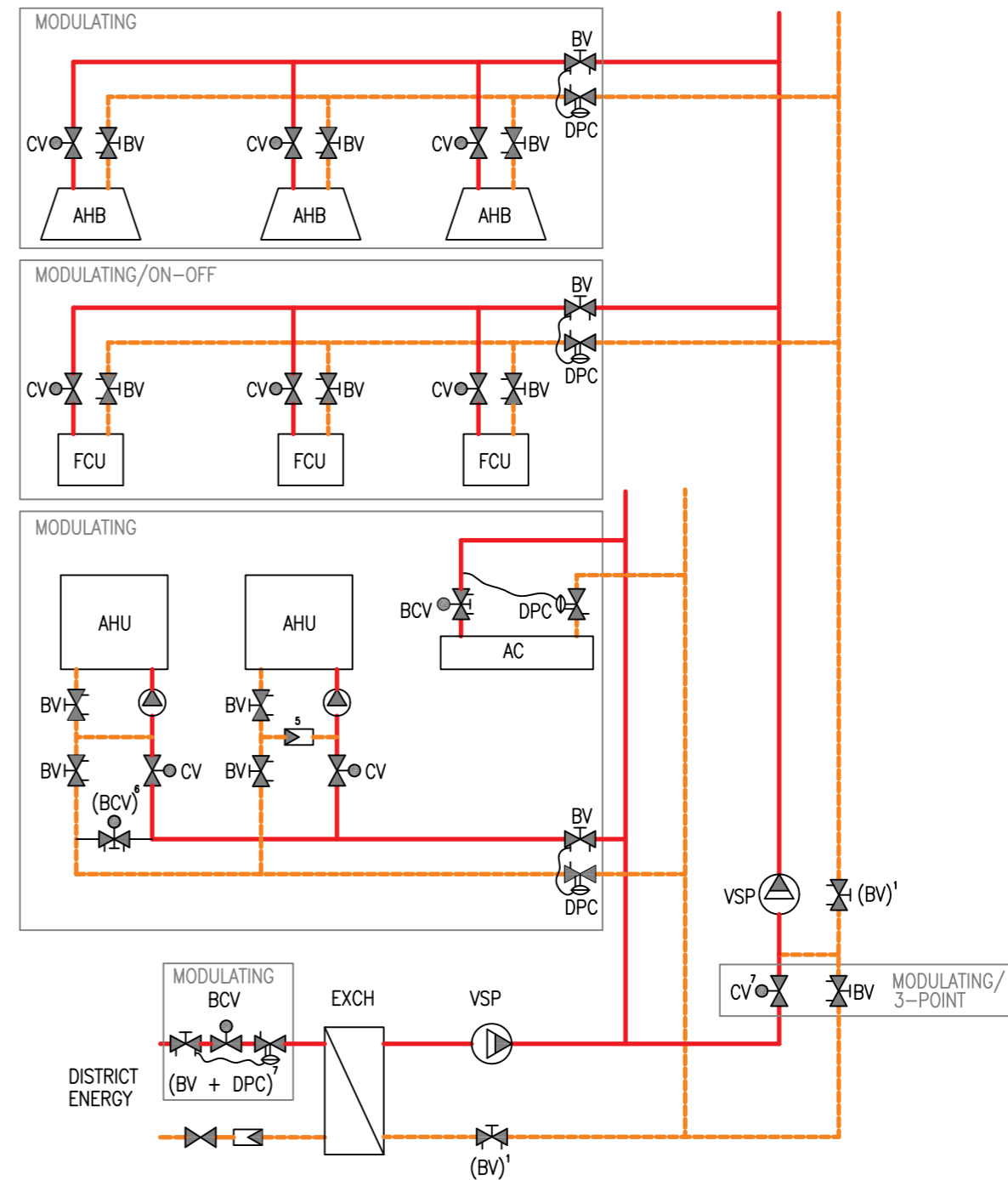
QUICK LINKS

A2		BCV	Combined balancing and control valves	page 9
A3		CV	2-way control valves	page 8
B1		BV	Balancing valves	page 22
B4		DPC	Differential pressure controllers	page 27

Acceptable

Energy efficiency low high

Investment low high



- 1) Optional/recommended for flow measuring and system diagnostics
- 5) Check valve is recommended to protect AHU against freezing up if secondary pump failed
- 6) Optional/recommended for maintaining hot water in the supply pipe (without or with actuator, opens when AHU control valve is fully closed)
- 7) Dp control recommended if control valve authority can drop below 0,25 during system operation due to big changes of differential pressure. Usually not needed for TA-FUSION-C with high control authority thanks to adjustable kvs

Legend:

CV	2-way control valve	VSP	Variable speed pump
BCV	Combined balancing and control valve	FCU	Fan-coil
BV	Balancing valve	AHU	Air handling unit
DPC	Differential pressure controller	AHB	Active heating beam
		AC	Air curtain
		EXCH	Heat exchanger

Heating system – variable flow

Thermostatic radiator valves with pre-setting

ENERGY EFFICIENCY

- Provides high temperature comfort and energy savings.
- Variable speed pump and Dp controllers help stabilize pressure conditions and keep proportional band within the recommended range to ensure small temperature hysteresis and quiet operation.
- Low pumping energy consumption (proportional control recommended).
- Minimal heat loss on return pipes.
- Low return temperature improves energy efficiency of heat pumps and condensing boilers.

INVESTMENT

- Low investment with fast return on investment.
- Premium quality with longevity.
- Lockshields save money by closing the radiator during renovation without the need to drain the whole heating system and stop heating (less system corrosion, higher comfort).
- Balancing valves and Dp controllers with great measuring and diagnostic capabilities help set pump head and find possible system failures.
- High flexibility. Heating system can be constructed gradually. It is recommended finish branches and commission balancing valve and Dp controller to avoid hydronic interactivity.




SIZING

- Sizing of thermostatic valves according to P-band within 1-2K with respect to maximal recommended pressure drop.
- Balancing valves and Dp controllers in large systems are recommended for quiet operation and highly efficient operation.
- Extensive portfolio of IMI Heimeier products offer optimal solution for each type of radiator or floor heating.
- NOTE: Usage of pressure independent balancing and control valves is forbidden in systems with thermostatic valves. They limit only maximal flow, increase pump head and remain fully open for the majority of the heating season due to their diversity factor.
- HySelect and IMI Hecos software will help you with hydronic calculations.

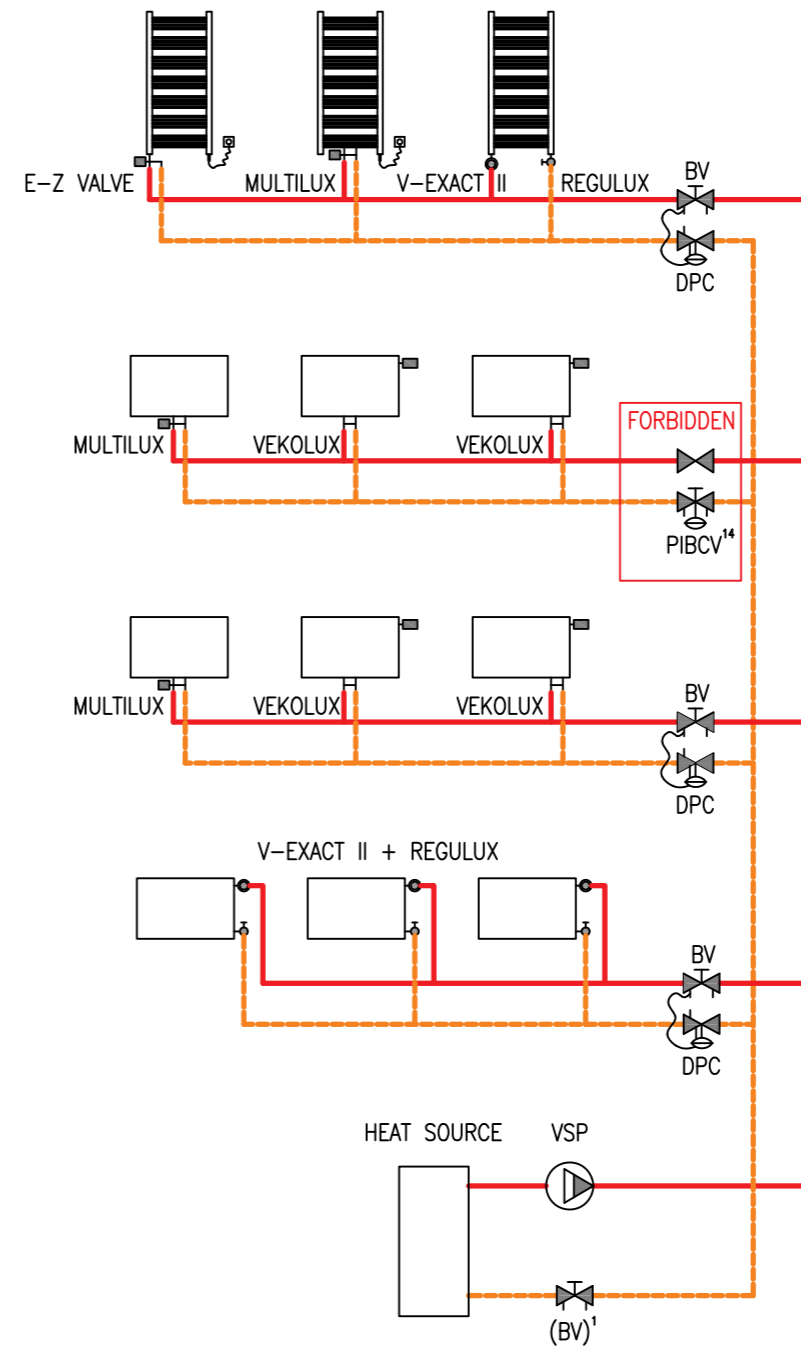
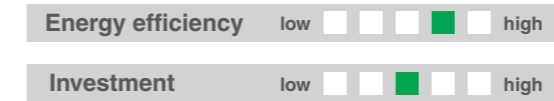
COMMISSIONING

- Easy pre-setting of thermostatic valves, balancing valves and Dp controllers according to the hydronic calculation.
- Direct measuring of actual flow and available differential pressure to accurately set the minimal required pump head and ensure quiet and energy efficient operation.
- It is recommended to limit maximal temperature for each room directly on the thermostatic head to avoid overheating. A fully open thermostatic head wastes energy!

QUICK LINKS

A1		PIBCV	Pressure independent balancing and control valves	page 4
B1		BV	Balancing valves	page 22
B4		DPC	Differential pressure controllers	page 27

Recommended



1) Optional/recommended for flow measuring and system diagnostics
 14) PIBCV (without actuator) limits only maximal flow when all TRV's are open. During partial load PIBCV remains fully open. Its pressure drop increases the demand on total pump head which creates noise during partial load.

Legend:

PIBCV	Pressure independent balancing and control valve	V-EXACT II	Thermostatic radiator valve with presetting
BV	Balancing valve	MULTILUX	Thermostatic radiator valve with presetting for two-point connection
DPC	Differential pressure controller	E-Z VALVE	Thermostatic radiator valve with presetting for one-point connection
		REGULUX	Radiator lockshield
		VEKOLUX	Radiator lockshield for two-point connection
		VSP	Variable speed pump control

Heating system – variable flow

AFC technology (Automatic Flow Control)

ENERGY EFFICIENCY

- High temperature comfort under all operating conditions.
- Automatic flow control limits overflows and helps avoid underflows.
- Low pumping energy consumption.
- Differential pressure control is required when maximal available differential pressure for AFC technology can be exceeded.
- Minimal heat loss on return pipes.
- Low return temperature improves energy efficiency of heat pumps and condensing boilers.

INVESTMENT

- Slightly higher investment is compensated by very high energy efficiency, system reliability, fast return on investment and simplicity of installation and commissioning.
- Proper function of all radiators and floor heating circuits without complaints and additional service costs.
- Quiet operation.
- Ideal solution for renovation - immediate improvement of system performance.
- High flexibility. Size of installation can be extended or reduced without impact on control quality.



SIZING

- Easy adjustment of AFC components according to maximal flow.
- Maximal differential pressure must be respected.
- Ideal solution for renovation in buildings with hidden pipes in walls/floors etc. Simplified hydronic calculation can be applied.
- HySelect and IMI Hecos software will help you with hydronic calculations.

COMMISSIONING

- Easy pre-setting of maximal flow.
- Automatic hydronic balancing.
- Pump head can be pre-set according to max. flow, proportional control is recommended.
- AFC insert can be removed by a special tool if needed in A-exact valves under system pressure.

QUICK LINKS

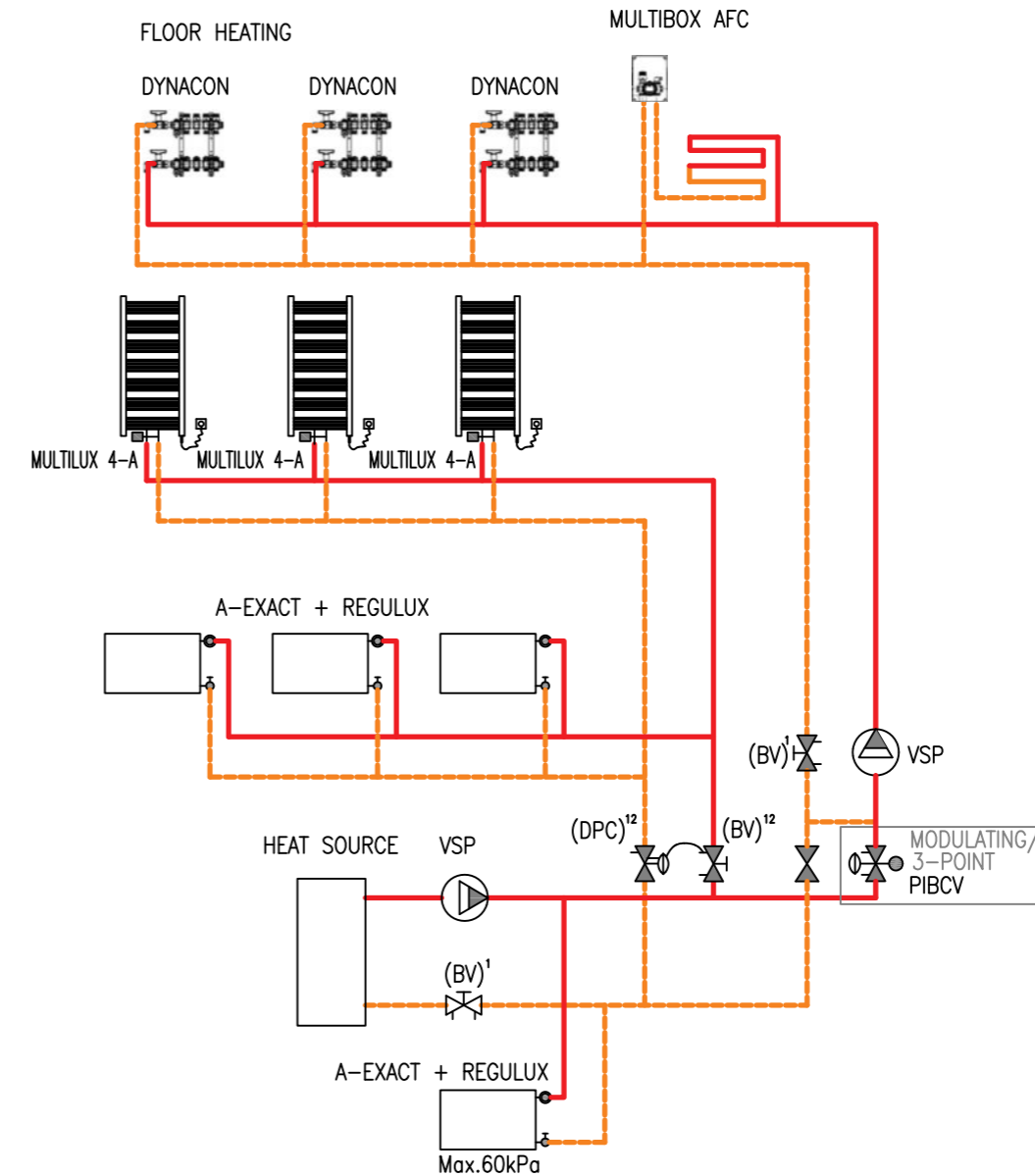
A1		PIBCV Pressure independent balancing and control valves	page 4
B1		BV Balancing valves	page 22

Learn more about benefits of AFC technology on the website www.imi-hydronic.com.

Recommended

Energy efficiency low high

Investment low high



¹⁾ Optional/recommended for flow measuring and system diagnostics
¹²⁾ Dp controller is only required if available differential pressure is higher than max. diff. pressure for AFC technology.

Legend:

PIBCV	Pressure independent balancing and control valve	A-EXACT	Thermostatic radiator valve with AFC technology
BV	Balancing valve	MULTILUX 4-A	Thermostatic radiator valve with presetting for two-point connection with AFC technology
		DYNACON	Floor heating manifold with AFC technology
		MULTIBOX AFC	Floor heating control with AFC technology
		REGULUX	Radiator lockshield
		VSP	Variable speed pump control

Heating system – constant flow

Balancing and standard control valves

ENERGY EFFICIENCY

- Control stability is high thanks to stable differential pressure in the entire system.
- High pumping energy consumption, constant flow and pressure drop of the system.
- High heat loss on return pipes during partial load.
- High return temperature during partial load decreases efficiency of heat pumps, condensing boilers and primary return temperature in district heating networks.
- Dirty filters and overflows significantly increase the annual operating costs.

INVESTMENT

- High number of installed valves.
- No possibility to apply diversity factor and decrease pipe sizes.
- Longer payback time of highly efficient variable speed pumps.
- Constant working regime decreases longevity of pumps.




SIZING

- Hydraulic calculation is needed for 3-way valves and balancing valves.
- Right Kvs value is essential for good control authority of a 3-way valve.
- 3-way valves controlling small terminal units need reduced Kvs value in direction AB-B or an additional balancing valve to limit overflows through the bypass during partial load or when valve is fully shut.
- HySelect and IMI Hecos software will help you with hydraulic calculations.

COMMISSIONING

- Pre-setting of balancing valves according to hydraulic calculation.
- Setting of pump head to achieve nominal constant flow, constant speed is obligatory.
- During commissioning, it is important to check flow compatibility between primary and secondary flow of AHU. Primary flow should be 5% higher if nominal supply temperatures are identical.

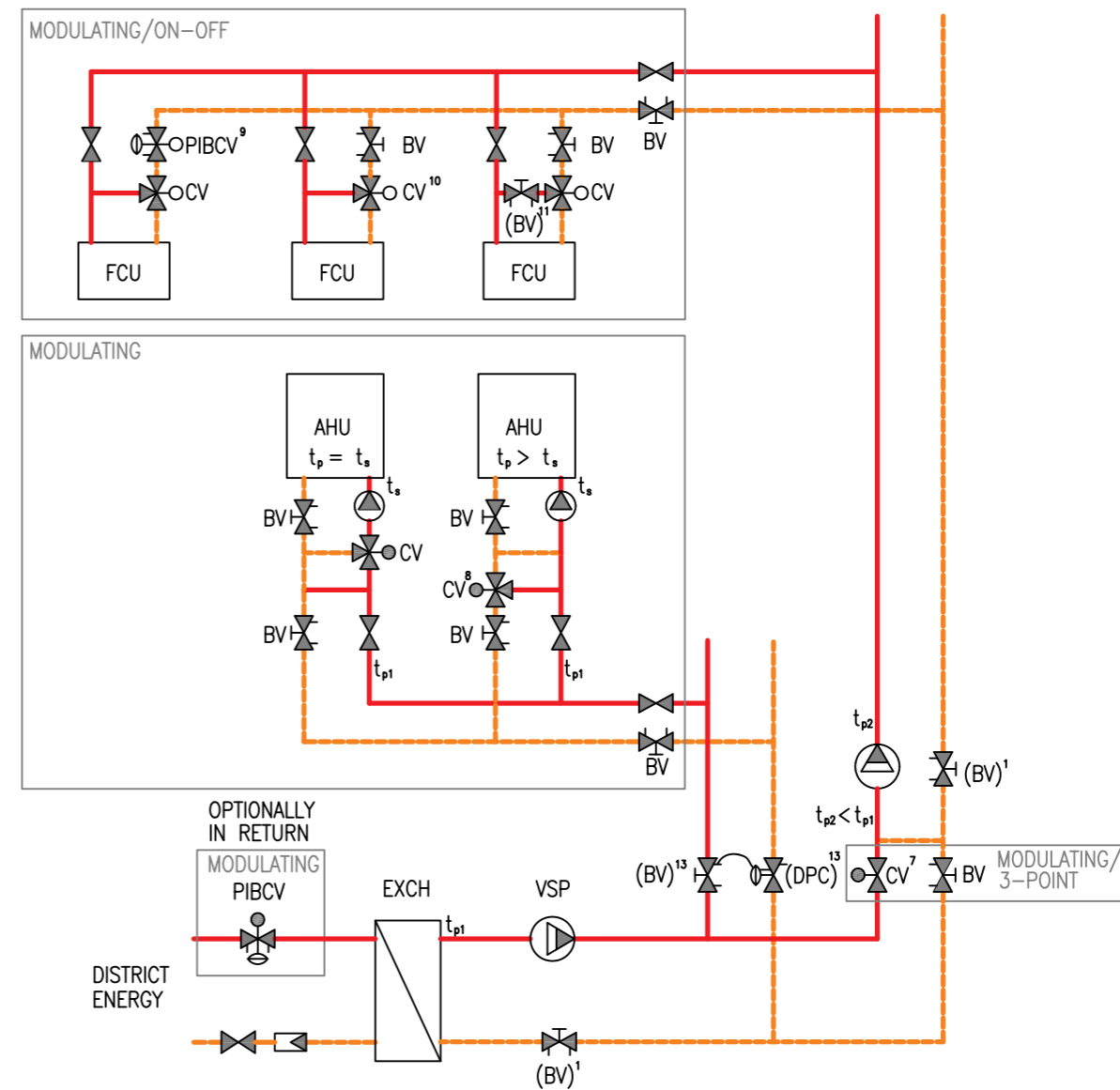
QUICK LINKS

A1		PIBCV	Pressure independent balancing and control valves	page 4
A3		CV	3-way control valves	page 8
B1		BV	Balancing valves	page 22

Energy efficiency low high

Investment low high

Not recommended



- 1) Optional/recommended for flow measuring and system diagnostics
- 7) Dp control recommended if control valve authority can drop below 0,25 during system operation due to big changes of differential pressure. Usually not needed for TA-FUSION-C with high control authority thanks to adjustable kvs
- 8) When temperature difference in primary circuit is higher, size of 3-way valve in that place can be smaller.
- 9) 3-way without reduced Kvs in direction B-AB without the possibility to balance bypass, PIBCV without actuator is recommend for maximal flow limitation.
- 10) 3-way valve with reduced Kvs in direction B-AB.
- 11) To balance bypass to get the same pressure drop as fan-coil.
- 13) Recommended bypass to get the same pressure drop as fan-coil.
This variant shows the system with different supply temperatures for AHU and FCU circuits.

Legend:

PIBCV	Pressure independent balancing and control valve	VSP	Variable speed pump control
CV	2-way control valve	FCU	Fan-coil
BV	Balancing valve	AHU	Airhandling unit
		EXCH	Heat exchanger

Cooling system – variable flow

Pressure independent balancing and control valves

ENERGY EFFICIENCY

- Provides stable and precise temperature control under all operating conditions .
- Pressure independent control with high control authority for modulating/3-point control.
- Low pumping energy consumption (no overflows).
- Very small pressure drop of IMI TA valves minimise the demands on pump head.
- Pump head optimisation thanks to unique diagnostic functions of IMI TA valves.
- Minimal heat gains on return pipes.
- Minimal risk of low return temperature and reduction of chiller energy efficiency.

INVESTMENT

- Recommended solution with minimal number of valves in installation.
- Excellent measuring and diagnostic capabilities of IMI TA valves enable full system diagnostics without additional investment in other devices.
- Fast return on investment, typically less than 3 years.
- High flexibility enables the system to build up gradually or add new terminal units in future without hydronic balancing, pump head should be optimized.




SIZING

- Simple valve selection by required maximal flow.
- Hydronic calculation based on minimal required differential pressure on reference valve and pressure drop of system during nominal conditions .
- No need to check control valve authority.
- Easy selection of suitable actuator .
- Complete range of valves for wide range of flows.
- HySelect and IMI Hecos software will help you with hydronic calculations.

COMMISSIONING

- Easy pre-setting of maximal flow on every valve.
- Direct measuring of actual flow and available differential pressure to set correctly minimal required pump head and ensure quiet and energy efficient operation.
- With the excellent diagnostic capabilities of IMI TA valves, it is easy to find and solve any possible system failures by using TA-Scope.

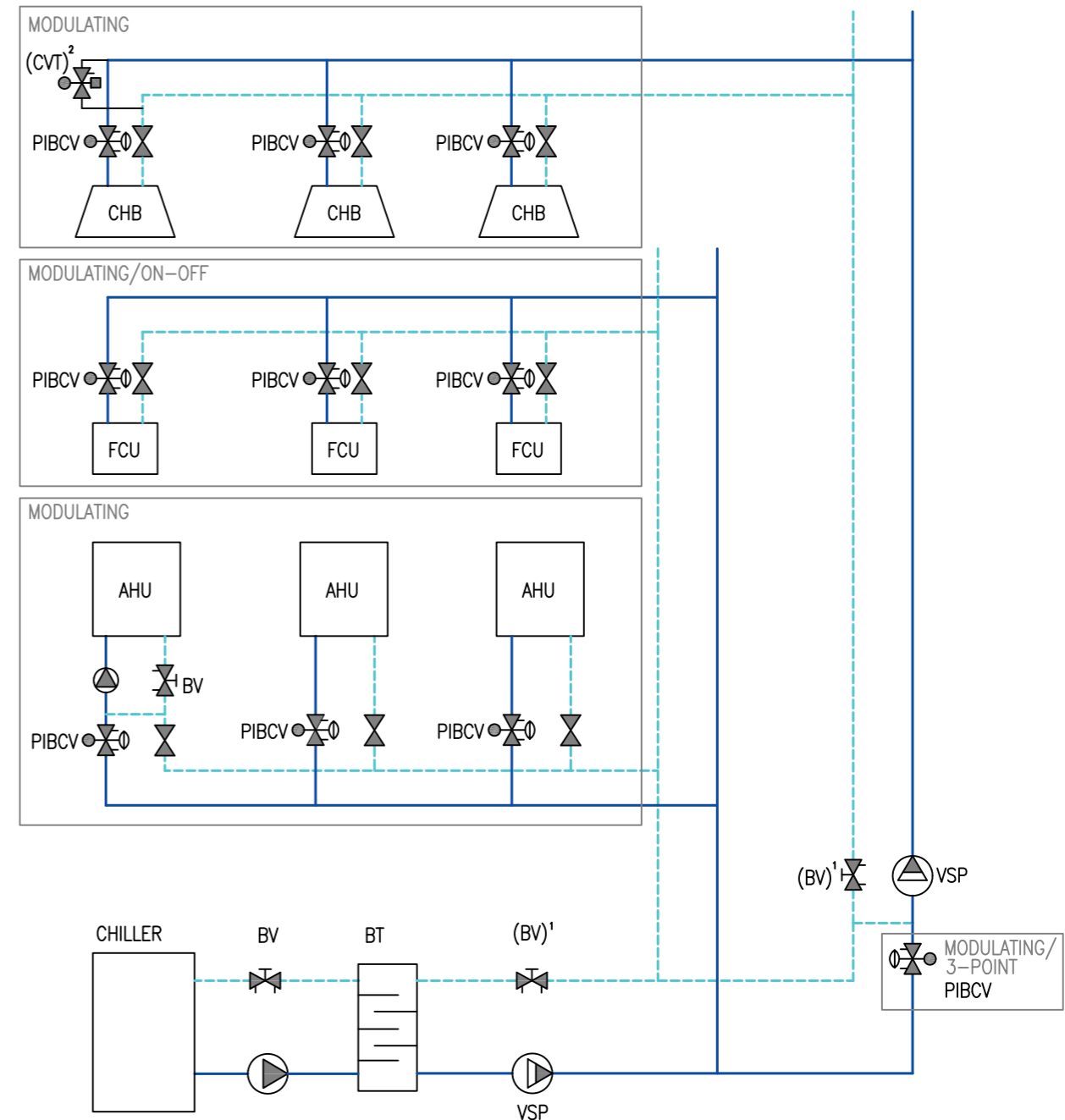
QUICK LINKS

A1		PIBCV	Pressure independent balancing and control valves	page 4
B1		BV	Balancing valves	page 22
A2		CVT	Control valve with return temperature controller TA-COMPACT-T	page 7

Recommended

Energy efficiency low high

Investment low high



1) Optional/recommended for flow measuring and system diagnostics
 2) Optional for maintaining constant cold water in supply pipe if needed. TA-COMPACT-T, setting 2K above supply temperature.
 NOTE: max. differential pressure 2 bar.

Legend:

PIBCV	Pressure independent balancing and control valve	VSP	Variable speed pump
BV	Balancing valve	FCU	Fan-coil
CVT	Control valve with return temperature controller TA-COMPACT-T	AHU	Air handling unit
		CHB	Chilled beam
		BT	Buffer tank

Cooling system – variable flow

Combined balancing and control valves

ENERGY EFFICIENCY

- Provides stable and precise temperature control under all operating conditions.
- Differential pressure controllers on branches stabilize pressure conditions for modulating valves and keep good control authority. TA-FUSION-C valves with fully adjustable Kvs value always works with high control authority and Dp controllers are not usually needed.
- Low pumping energy consumption .
- Pump head optimisation possible thanks to unique valves diagnostic functions.
- Minimal heat gains on return pipes.
- Minimal risk of low return temperature and reduction of chiller energy efficiency.

INVESTMENT

- Recommended solution with good balance between energy efficiency and investment.
- Depending on system structure, this solution is typically cheaper in comparison to D1 although some balancing valves and differential pressures on braches are needed.
- Dp controllers are not needed (lower investment) when TA-FUSION-C in used with adjustable Kvs.
- Excellent measuring and diagnostic capabilities of IMI TA valves enable full system diagnostics without additional investment in other devices.
- Fast return on investment, typically less than 3 years.
- High flexibility. Cooling system can be constructed gradually without the need to perform hydronic balancing, pump head should be set to the new system demands.

SIZING

- Sizing of the valve according to nominal flow and minimal pressure drop (1/3 of total presure drop of branch, without control valves, controlled by Dp controller) to ensure good control authority.
- High control authority of TA-FUSION-C thanks to adjustable Kvs, minimal risk of undersizing.
- Under certain conditions, On-Off control can create some overflows during partial load. This phenomenon can be limited during project design.
- Actuator closing pressure must be checked.
- We do recommend using pressure independent balancing and control valves for separate small terminal units connected directly to main pipe to ensure high control authority and limit overflows.
- HySelect and IMI Hecos software will help you with hydronic calculations.

COMMISSIONING

- Easy pre-setting of valves according to hydronic calculation.
- Direct measuring of actual flow and available differential pressure enables you to properly set the minimal required pump head.
- Flow measuring of individual small control valves in branch possible but not obligatory.
- Freely adjustable Kvs of TA-FUSION-C enables to increase control authority when control hunting occurs.
- With the excellent diagnostic capabilities of IMI TA valves, it is easy to find and solve any possible system failures by using TA-Scope.

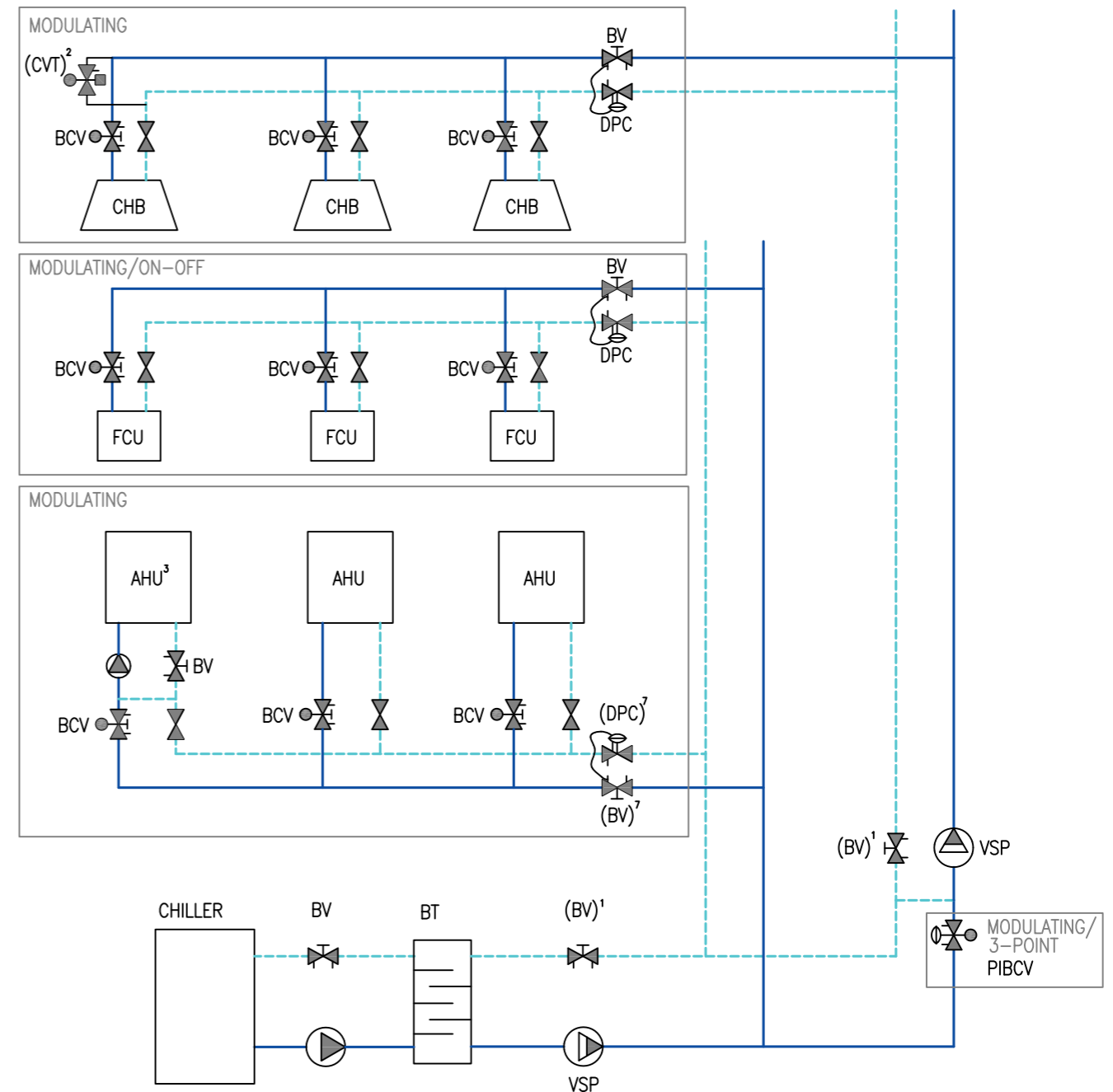
QUICK LINKS

A1		PIBCV	Pressure independent balancing and control valves	page 5
A2		BCV	Combined balancing and control valves	page 6
A2		CVT	Control valve with return temperature controller TA-COMPACT-T	page 7
B1		BV	Balancing valves	page 22
B4		DPC	Differential pressure controllers	page 27

Recommended

Energy efficiency low high

Investment low high



- 1) Optional/recommended for flow measuring and system diagnostics.
- 2) Optional for maintaining constant cold water in supply pipe if needed. TA-COMPACT-T, setting 2K above supply temperature. NOTE: max. differential pressure 2 bar.
- 3) Example when requested supply temperature for AHU is higher than global supply temperature.
- 7) Dp control recommended if control valve authority can drop below 0,25 during system operation due to big changes in differential pressure. Usually not needed for TA-FUSION-C with high control authority thanks to adjustable kvs.

Legend:

PIBCV	Pressure independent balancing and control valve	VSP	Variable speed pump
BCV	Combined balancing and control valve	FCU	Fan-coil
BV	Balancing valve	AHU	Air handling unit
DPC	Differential pressure controller	CHB	Chilled beam
CVT	Control valve with return temperature controller TA-COMPACT-T	BT	Buffer tank (low loss header function)

Cooling system – variable flow

Balancing and standard control valves

ENERGY EFFICIENCY

- Provides stable and precise temperature control under all operating conditions if control valves are properly sized and good control authority can be achieved.
- Stability of differential pressure for modulating or 3-point control is ensured by differential pressure controllers on branches.
- Low pumping energy consumption.
- Pump head optimisation possible.
- Minimal heat gains on return pipes.

INVESTMENT

- Higher investment in comparison to solution D2, control valves require balancing valves.
- Bigger flows require bigger sizes of balancing valves and Dp controllers on branches (TA-PILOT-R decreases investment thanks to high Kvs values).
- Great measuring and diagnostic capabilities enable full system diagnostics without additional investment in other devices.
- High flexibility. Cooling system can be constructed gradually. It is recommended to finish branches and commission balancing valve and Dp controller to avoid hydronic interactivity.

SIZING

- Control valve sizing according to nominal flow and minimal pressure drop (1/3 of total pressure drop of branch without control valves controlled by Dp controller) to ensure good control authority.
- Closing pressure of actuator must be checked.
- Balancing valves and Dp is simple to select by using HySelect or IMI Hecos software.

COMMISSIONING

- Easy pre-setting of all balancing valves and Dp controllers according to hydronic calculation.
- Dp controllers should be set according to real measured pressure drop of specific branch.
- Minimize pump head by using TA Balancing methods.
- With the excellent diagnostic capabilities of IMI TA valves, it is easy to find and solve any possible system failures by using TA-Scope.

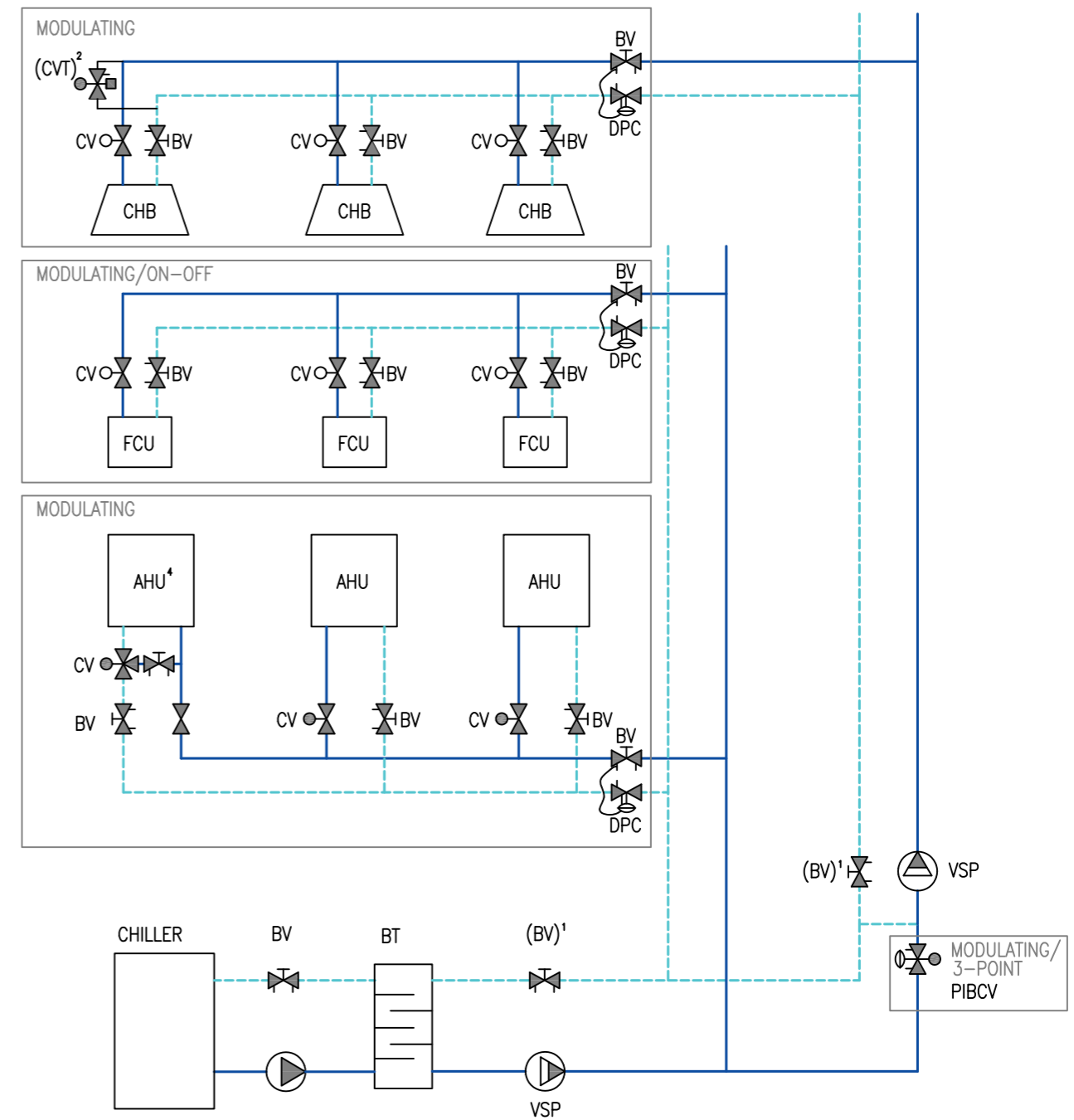
QUICK LINKS

A1		PIBCV Pressure independent balancing and control valves	page 4
A2		CVT Control valve with return temperature controller TA-COMPACT-T	page 7
A3		CV 3-way / 2-way control valves	page 8
B1		BV Balancing valves	page 22
B4		DPC Differential pressure controllers	page 27

Acceptable

Energy efficiency low high

Investment low high



1) Optional/recommended for flow measuring and system diagnostics
 2) Recommended for maintaining cold water in supply pipe (TA-COMPACT-T)
 4) Example when minimal flow in the cooling system is required.

Legend:

PIBCV Pressure independent balancing and control valve	VSP Variable speed pump
BV Balancing valve	FCU Fan-coil
BCV Combined balancing and control valve	AHU Air handling unit
CV 3-way / 2-way control valve	CHB Chilled beam
CVT Control valve with return temperature controller TA-COMPACT-T	BT Buffer tank

Cooling system – variable flow

Control valves with return temperature controller

ENERGY EFFICIENCY

- Unique On-off control modulates flow according to return temperature.
- Always correct return temperature in entire system.
- No risk of low return temperature and reduction of chiller energy efficiency.
- Minimal heat gains on return pipes.
- Low pumping energy consumption.
- Increases room temperature comfort when fan operates on minimal speed (the feeling of cold is limited).

INVESTMENT

- Low investment in On-Off control with benefits of modulating control.
- Easy installation, a small number of valves.
- High flexibility enables you to construct the system gradually or disconnect terminal units.

SIZING

- Ideal solution for renovation with a lack of information about existing pipeline network.
- Sizing of the valve according to nominal flow and requested P-band of return temperature controller.
- Dp controllers on branches are recommended
 - if maximal differential pressure can be exceeded
 - in large systems with setback night mode to accelerate mornings start-ups
- Easy selection of suitable On-Off actuators.
- Not recommended for systems where supply temperature is not constant.

COMMISSIONING

- Easy direct pre-setting of requested return temperature.
- Pump head setting according to hydronic calculation, proportional control recommended.
- TA-COMPACT-T enables you to measure and monitor return temperature by using TA-Scope.

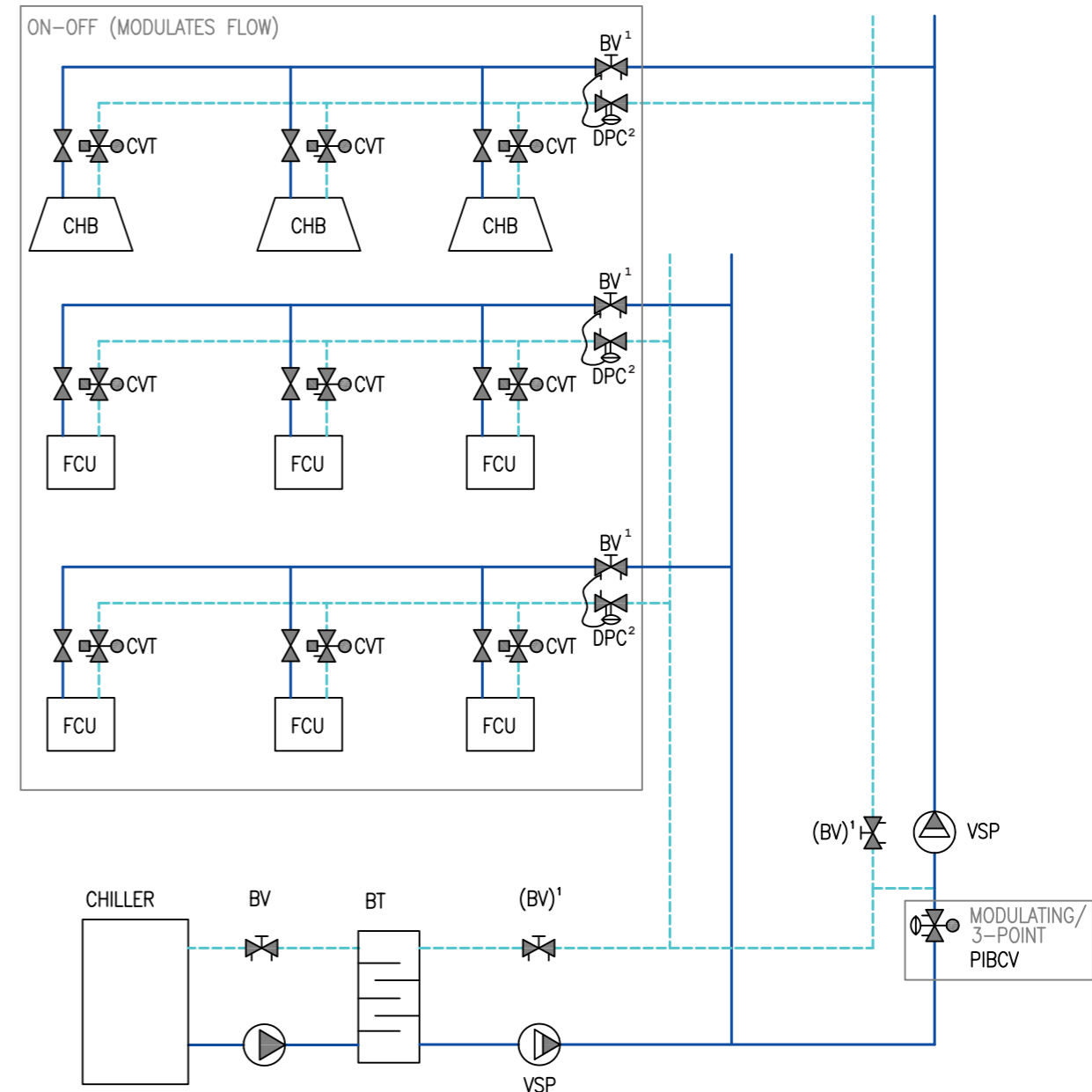
QUICK LINKS

A1		PIBCV	Pressure independent balancing and control valves	page 4
A2		CVT	Control valve with return temperature controller TA-COMPACT-T	page 7
B1		BV	Balancing valves	page 22
B4		DPC	Differential pressure controllers	page 27

Recommended

Energy efficiency low high

Investment low high



1) Optional/recommended for flow measuring and system diagnostics
 2) Differential pressure controllers are recommended if maximal differential pressure for CVT valves can be exceeded.

Legend:

PIBCV	Pressure independent balancing and control valve	FCU	Fan-coil
BV	Balancing valve	CHB	Chilled beam
DPC	Differential pressure controller	VSP	Variable speed pump
CVT	Control valve with return temperature controller TA-COMPACT-T	BT	Buffer tank

Cooling system – constant flow

Balancing and standard control valves

ENERGY EFFICIENCY

- Control stability is high thanks to stable differential pressure in the entire system.
- High pumping energy consumption, constant flow and pressure drop of the system.
- High heat gains on return pipes during partial load.
- Low return temperature has positive impact on energy efficiency of chillers.
- Dirty filters and overflows significantly increase the annual operating costs.

INVESTMENT

- High number of installed valves, typically bigger sizes.
- No possibility to apply diversity factor and decrease pipe dimensions.
- Longer payback time of highly efficient variable speed pumps.
- Constant working regime decreases longevity of pumps.




SIZING


- Hydronic calculation is needed for 3-way valves and balancing valves.
- Right Kvs value is essential for good control authority of 3-way valve.
- 3-way valves controlling small terminal units need reduced Kvs value in direction AB-B or additional balancing valve in the bypass to limit overflows during partial load or when valve is fully shut. PIBCValve used without actuator as flow limiter is the optional solution.
- HySelect and IMI Hecos software will help you with hydronic calculations.


COMMISSIONING

- Pre-setting of balancing valves according to hydronic calculation.
- Setting of pump head to achieve nominal constant flow, constant speed is obligatory.
- Hydronic balancing or just flow measuring to check real flows is recommended. Balancing valves in AHU bypasses must be set according to pressure drop of AHU unit. Fully open balancing valves creates overflows when 3-way control valves are shut.

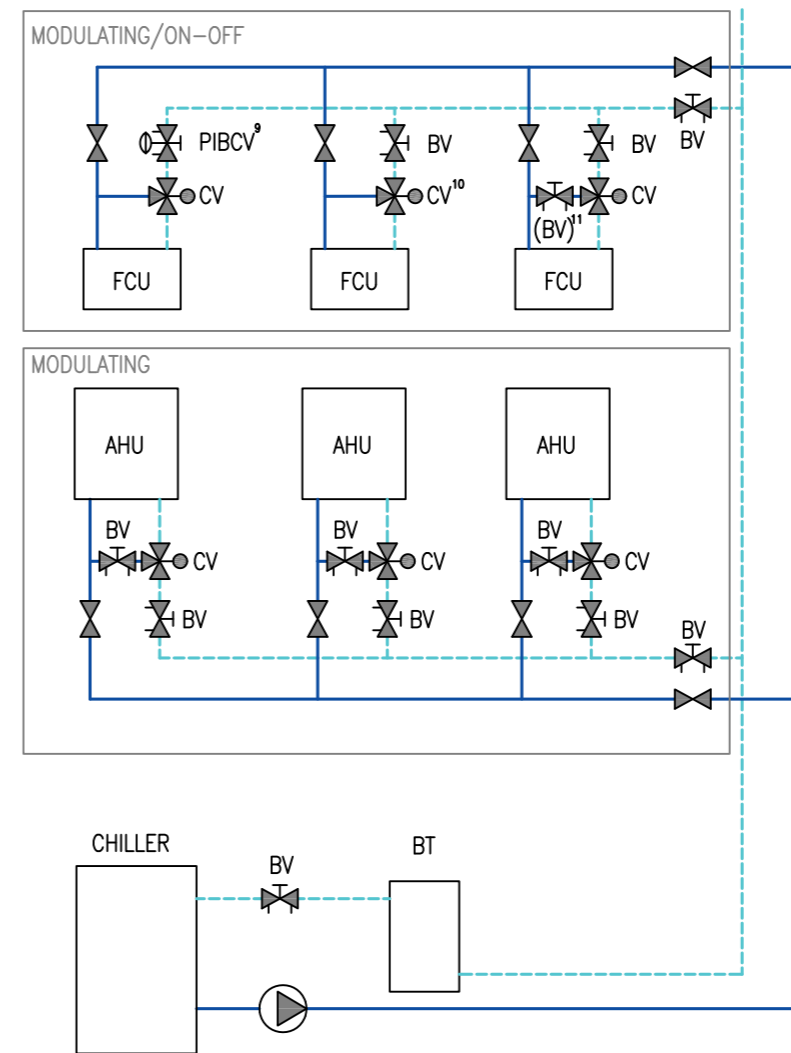
QUICK LINKS

A1		PIBCV	Pressure independent balancing and control valves	page 4
A3		CV	3-way control valves	page 8
B1		BV	Balancing valves	page 22

Energy efficiency low  high

Investment low  high

Not recommended



9) 3-way without reduced Kvs in direction B-AB without possibility to balance bypass, PIBCValve without actuator is recommended for maximal flow limitation.

10) 3-way valve with reduced Kvs in direction B-AB.

11) To balance bypass to get the same pressure drop as fan-coil.

Legend:

PIBCV	Pressure independent balancing and control valve	FCU	Fan-coil
CV	3-way / 2-way control valve	AHU	Airhandling unit
BV	Balancing valve	BT	Buffer tank

Extra – variable flow

Auto-adapting variable flow decoupling circuit

ENERGY EFFICIENCY

- Enables variable speed controllers to work and save energy.
- Very high energy efficiency guaranteeing perfect and quiet system operation without negative hydronic interactivity.
- Pumphead of secondary pump can be decreased by differential pressure kept on differential pressure controller (primary pump helps the secondary one). Primary pump can supply secondary circuit in case of secondary pump failure.
- No risk of low (cooling) or high (heating) return temperature with impact on energy efficiency in the production.
- Low pumping energy consumption (variable flow).
- Minimal heat gains/losses in return pipes.
- The supply water temperature is kept as supplied from the production (primary).
- Higher energy efficiency can be achieved by remote VSP controller (please contact Hydronic College specialist, they will help you to find the right place and setting).
- Effective control circuit without actuator and conventional control valve (DPC do not require electric power to operate).

INVESTMENT

- Very low investment in comparison to alternative solutions which decrease energy efficiency and increase the complexity of the system.
- Easy installation, minimal space required.
- Ideal solution for circuits with higher pressure drop but connected to network with less differential pressure available, investment to the new primary pump not needed.
- Fast return on investment.
- Quiet operation, no complaints.

SIZING

- Tertial flow through the bypass is typically 1% of total secondary flow thus the balancing valve in the bypass has small dimensions.
- No need for additional solutions to maintain min. flow of primary pump if tertial by-pass flow is sized accordingly.
- Dp controller is designed for nominal secondary flow, pressure drop is managed by primary pump.
- Setting range of DP controller according to pressure drop of balancing valve in bypass (taken into account when sizing secondary pump).
- Please contact your Hydronic College specialist in case technical support is needed.

COMMISSIONING

- Easy pre-setting of balancing valve in bypass.
- Setting of diffential pressure on Dp controller by measuring tertial flow by using TA-Scope.

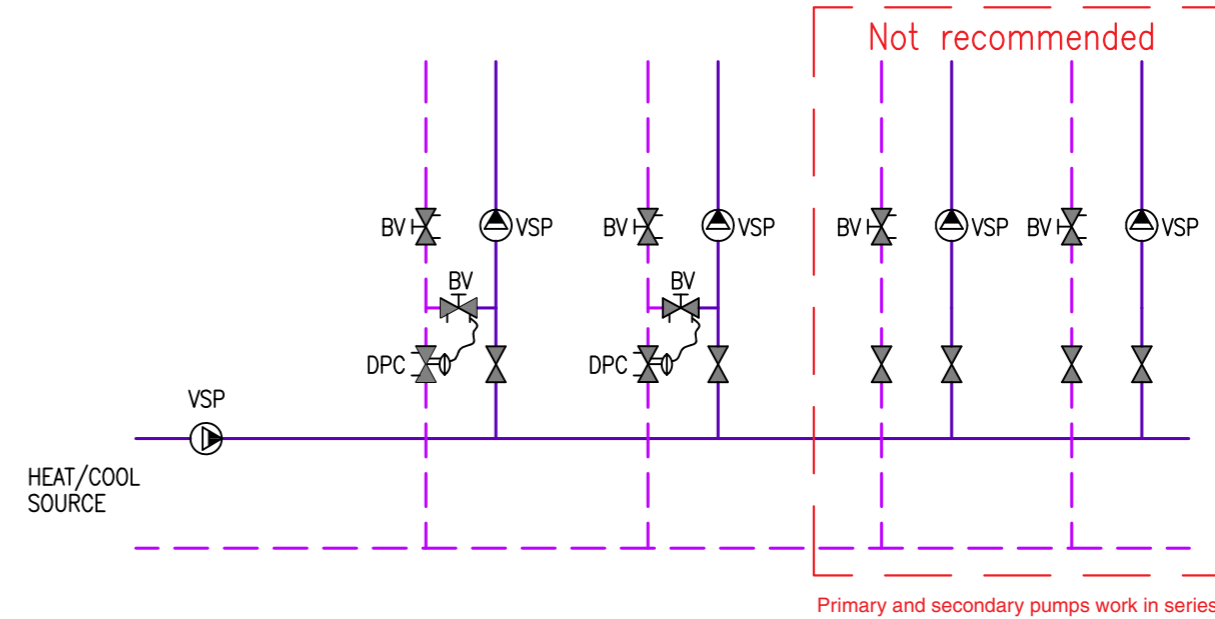
QUICK LINKS

B1		BV	Balancing valves	page 22
B4		DPC	Differential pressure controllers	page 27

Energy efficiency low high

Investment low high

Recommended



Auto-adapting variable flow decoupling circuit is an ideal solution for variable primary and secondary circuits when secondary pump must be used to hydraulically decouple differential pressure from primary pump. The supply water temperature is kept as supplied from production (primary). Nominal flow through the bypass is typically 1% of total secondary flow thus balancing valve in the bypass is small. Minimum flow rate through bypasses can also be determined by the minimum flow of primary pump.

Please ask your Hydronic College partner for more information about sizing and hydronic balancing.

Legend:

BV Balancing valve **VSP** variable speed pump control
DPC Differential pressure controller

Comfortable indoor climate at Brazil's iconic Maracanã Stadium



FACTS

Project Type:	Sporting stadium renovation
Location:	Rio de Janeiro, Brazil
Owner:	Consórcio Maracanã
Consultant:	DW Engenharia
Gross area:	240,000 m ²

As part of the complete renovation of Brazil's famous Maracanã stadium in Rio de Janeiro where the 2014 World Cup took place, project leaders, Consórcio Maracanã, wanted to increase HVAC efficiency across the iconic stadium. As such, they set out to find a partner with the sufficient know-how and capability required to meet their sustainable indoor climate requirements. **IMI Hydronic Engineering proved to be the partner with the perfect solution.**

The near three-year refurbishment of Brazil's largest stadium comprised an expansion from 189,000 m² to 240,000 m², and now also boasts 328 parking spaces, 292 restrooms, 60 bar areas across five floors and is lit by 23,500 low-maintenance LED lighting fixtures and is installed with rain water collection and clean energy solutions.

The challenge

Project leaders Consórcio Maracanã envisioned transforming the stadium into an environmental heritage for Brazil by saving natural resources such as water and electricity and thereby receiving Leadership in Energy and Environmental Design (LEED) environmental accreditation, from the Brazilian Green Building Council.

As such, in line with the stadium's sustainable vision, a cooling system with a capacity of 10,620 kW was required to maintain a healthy and comfortable indoor climate with precise temperature control and a high level of efficiency.

The solution

During the latest of many successful collaborations between the two companies, IMI Hydronic Engineering worked closely with consultant, DW Engenharia, from the outset of the project, providing full design support in a bid to deliver the stadium's indoor climate and temperature requirements.

The first step in reaching the optimal solution was to review the existing system. IMI Hydronic Engineering began with a thorough analysis using Hy select to help determine the optimum component selection, and discussions with the client at a strategic-level as to how the system should respond. The close co-operation enabled both parties to agree on solutions that would guarantee the best hydronic design possible.

As such, it was agreed that the solution would comprise a range of high performance STAF and STAD balancing valves, STAP differential pressure controllers, TBV-C terminal valves, KTM 512 pressure-independent temperature control valves, Statico and Pleno pressure-maintenance devices and the TA-SCOPE flow and pressure measurement and diagnostics instrument, as well as further support during commissioning of the project.

IMI Hydronic Engineering also provided installation support to ensure that new components were installed correctly and assisted in the commissioning phase providing balancing expertise and ensuring that the solution would meet the stadium's desired sustainable indoor climate requirements from the outset.

The Outcome

During the stadium's official reopening in June, it became clear that the new system was able to successfully deliver a comfortable indoor climate, providing energy savings of 4% achieved through cooling system optimisation.

The state-of-the-art stadium has since successfully received LEED environmental accreditation, meeting three American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) standards – the most common LEED standard – for efficiency (90.1), HVAC system quality (62.1) and user comfort (55).

"With the company holding such a fantastic working relationship with IMI Hydronic Engineering spanning several successful projects, we had no hesitation that they would deliver once again. We had every confidence that the solution, over the course of the 2014 World Cup finals, would not only continue to deliver the ideal indoor climate, but would provide remarkable energy savings in the process."

Danilo Werneck, owner of DW Engenharia.

APPLIED SOLUTIONS: combination of **D7** **D8** **D9**

PRODUCTS INSTALLED:

- Balancing valves STAD and STAF DN 20-250
- Differential pressure controllers STAP DN 15-100, DA 516 DN 125-150
- Pressure independent balancing and control valves KTM 512 DN 125-150
- Combined balancing and control valves TBV-C DN 20-25
- Standard control valves DN 32-65
- Shut-off valves manual and with actuator DN 20 - 300
- Air vents Zeparo ZUT DN 20
- Balancing instrument TA-Scope
- Measuring device TA-Link
- Expansion vessel Statico SG with DSV 32
- Water make up system Pleno PI



IMI Hydronic Engineering takes control over the perfect climate for the world's tallest building.

Burj Khalifa Tower

FACTS

Project Type: Office & Commercial buildings

Location: Dubai

Consultant: Hyder Consulting

The challenge

The tallest building in the world, the prestigious Burj Khalifa was designed by Adrian Smith and is being constructed by Skidmore, Owings & Merrill – the global leader in creating super-tall structures – for Emaar Properties. Skidmore Owings & Merrill is leading the architectural, structural engineering and mechanical engineering of the Burj Khalifa.

Covering a staggering 344,000sqm, the Burj Khalifa represents the ultimate in luxury accommodation; residential units, hotels – including the flagship new Armani Hotel – four swimming pools, several restaurants, a library, and a 15,000sqm fitness suite which will all be enclosed in the 808m high tower.

Such a broad scope of applications, the sheer height of the building, and the

extreme heat of its location, mean that a consistent internal climate is absolutely vital. Hyder Consulting, on behalf of Skidmore Owings & Merrill, requires a highly efficient and effective cooling system for this remarkable building to be designed, installed and commissioned, on budget and to tight time constraints.

The solution

The 8,000 or so valves specified by Hyder Consulting include IMI TA balancing valves and pressure independent balancing and control valves.

Bespoke balancing valves recommended by and commissioned by IMI Hydronic Engineering are capable of controlling a complex cooling system throughout the building, comprising some 946,000 litres of water.

The time-savings inherent in the IMI Hydronic Engineering solution provide significant value over alternative approaches. The time taken for the system to be commissioned was crucial for the installers because, under contractual obligations, delays will be penalised.

IMI Hydronic Engineering was able to present the contractor with an innovative and more time efficient installation, based on its understanding of the customer's unique requirements. Throughout the process, IMI Hydronic Engineering ensured that the proposed solution was fully understood by all parties.

This customer-focused approach instilled confidence in both the workability and the essential time savings inherent in the innovative solution.

APPLIED SOLUTIONS:

D7

PRODUCTS INSTALLED:

- Pressure independent balancing and control valves KTC-512, KTM-512, TA-R25 actuators
- Balancing valves STAF, STAF SG
- Fixed orifices MDF0
- Expert system components TA64, STR640

We take control over perfect indoor climate for 93 000 plants



Gardens by the Bay

FACTS

Project Type:	The conservatory complex at Gardens by the Bay, comprises two cooled conservatories
Location:	18 Marina Gardens Drive, Singapore
Owner:	National Parks Board
Total estimated project value:	GBP 477 million

Gardens by the Bay in Singapore is made up of Bay South, Bay East and Bay Central, that occupy 101 hectares of prime land. Bay South Garden, the largest of the three at 54 hectares, is home to two cooled conservatories housing over 93,000 plants of more than 1,160 species. The whole complex required very accurate temperature control to stimulate plant growth, without compromising on energy efficiency. **As such, an expert HVAC provider with the know-how and capability to meet the indoor climate requirements was called upon.**

Set to fulfill Singapore's ambitious plan to become a 'City within a Garden', the National Park's Board commissioned the Gardens by the Bay Park, set in 101 hectares of reclaimed land in the heart of Singapore's new downtown.

The award-winning, L477 million horticultural attraction has become one of the city's top attractions since it opened in 2012, and has won the World Architecture Festival's World Building of the Year 2012 and the BCA Green Mark for Parks Platinum Award 2013.

Gardens by the Bay received over 5 million visitors in its first year of operation.



The challenge

The conservatory complex comprises two cooled conservatories, which enclose an area of approximately two hectares and reach a height of 58 metres above the shore of the bay. Built with sustainable engineering and energy efficiency in mind, the Flower Dome (one of the world's largest columnless greenhouses) and the Cloud Forest each contain thousands of rare plants as well as a wide range of habitats and environments.

The National Parks Board required a system where temperature can be controlled accurately to three different temperature levels – summer daytime, winter daytime and night time, imitating the natural surroundings of the plants and thereby optimising their growth conditions and maximising lifetime without compromising on energy efficiency. This was no simple feat.

This called for the expertise of an experienced HVAC solutions provider to see the project through from the initial design stage to completion.

The solution

Thanks to its vast experience and expertise, IMI Hydronic Engineering was handpicked as the ideal provider for specialist hydronics components to meet the project's indoor climate requirements. Following detailed analyses of the chilled water systems and leveraging of the capabilities of TA Select, for selecting and sizing balancing valves and differential pressure controllers, IMI Hydronic Engineering devised the optimum solution to ensure hydronic system control.



The solution comprises a combination of STAD and STAF balancing valves, STAP differential pressure controllers and DA516 district differential pressure controllers.

IMI Hydronic Engineering also provided installation support to ensure that all components were installed successfully and assisted in the commissioning phase, ensuring that the solution would deliver from the outset and provide the fine degree of temperature control the project required.

APPLIED SOLUTIONS: **D7** by using differential controllers for control valves

PRODUCTS INSTALLED:

- STAD
- STAF
- DA 516
- STAP