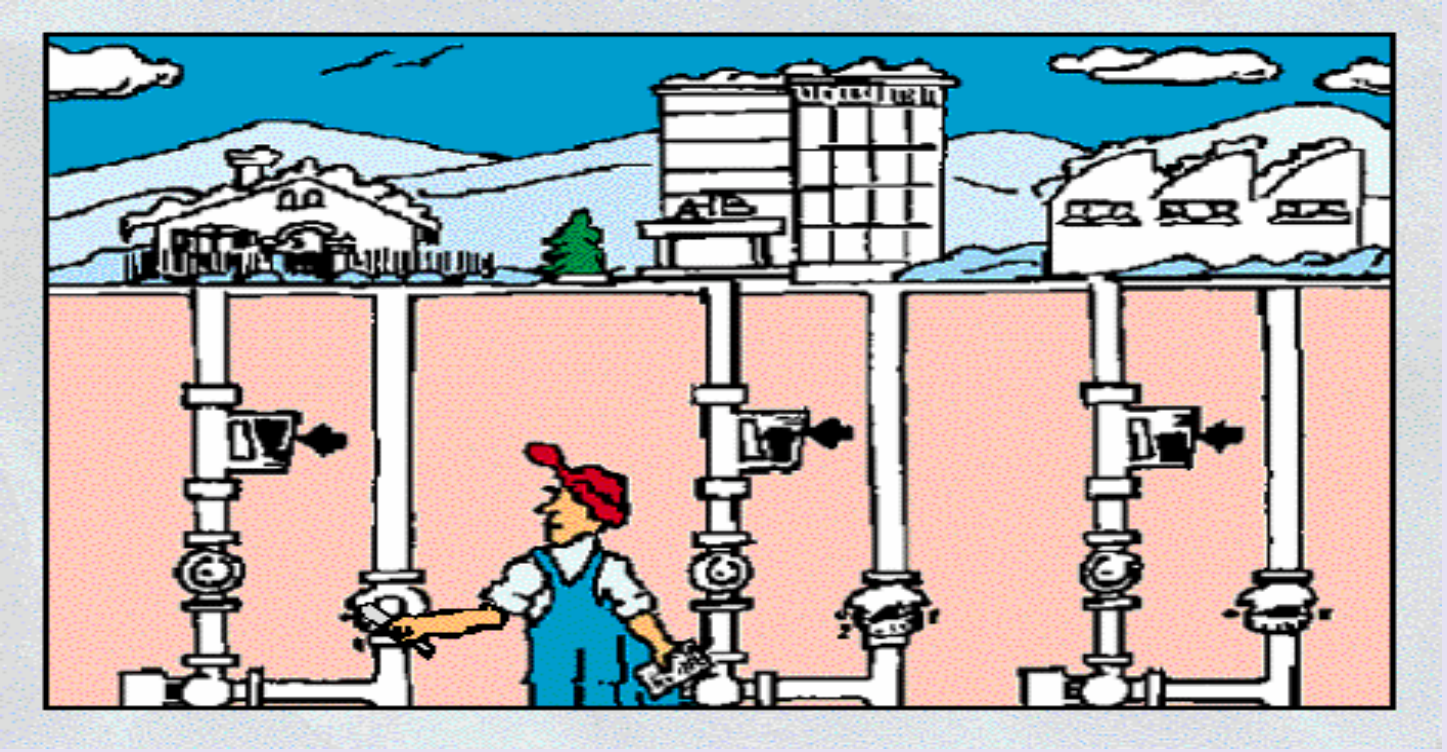
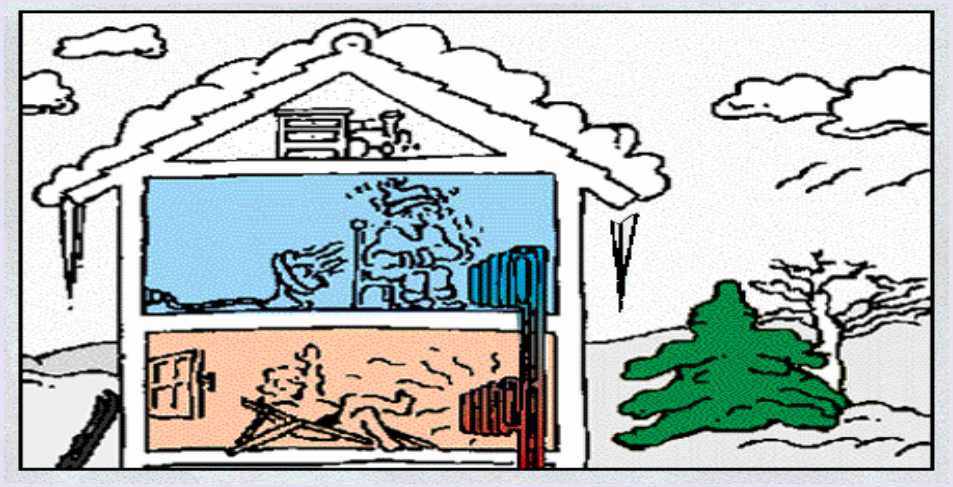
Problems in the heating system and why do we need to balance?



Problem / Reason 1

Excessive volumetric flow in one part of the plant causes too low flow rates in another

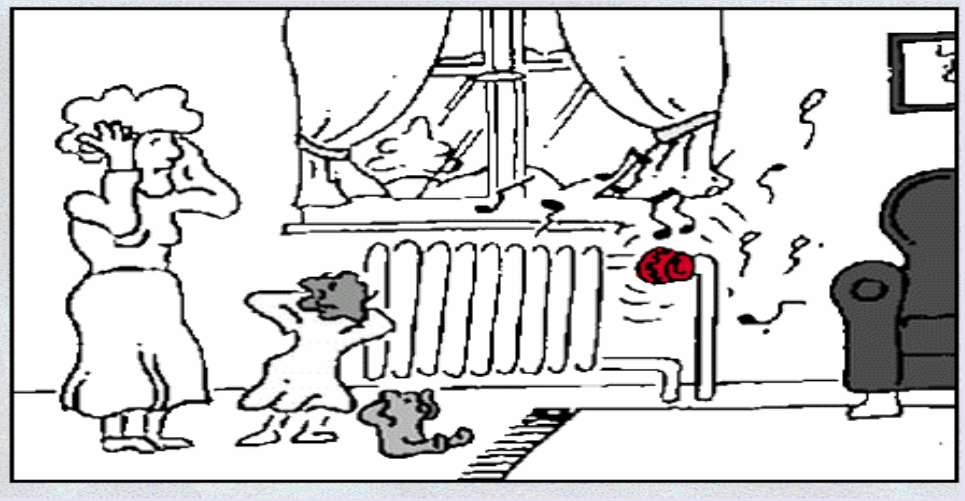


Proper hydraulic balancing creates comfort and saves energy

® *Saving potential 10% - 20%*

Problem / Reason 2

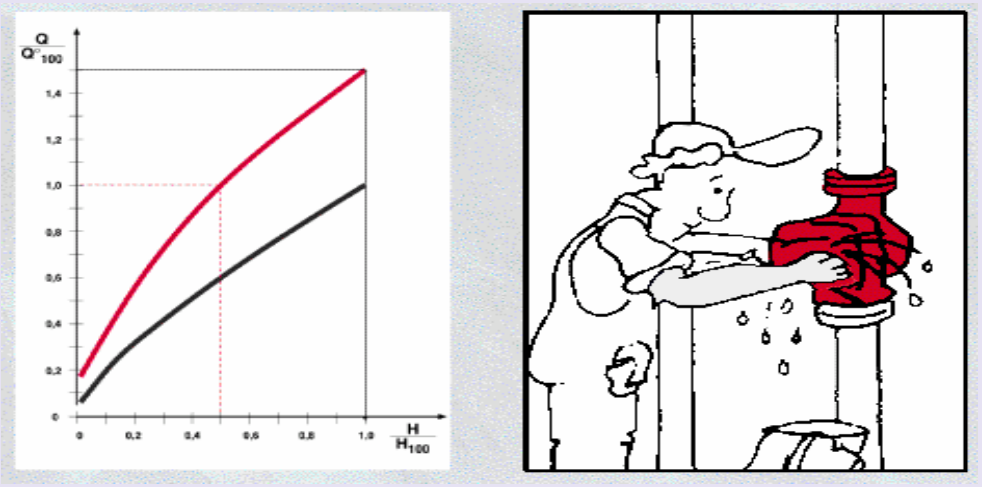
Excessive differential pressure can cause whistling noise -- along with overheated rooms



Only proper hydraulic balancing of the plant and a correctly sized pump ensure that no noise will occur

Problem / Reason 3

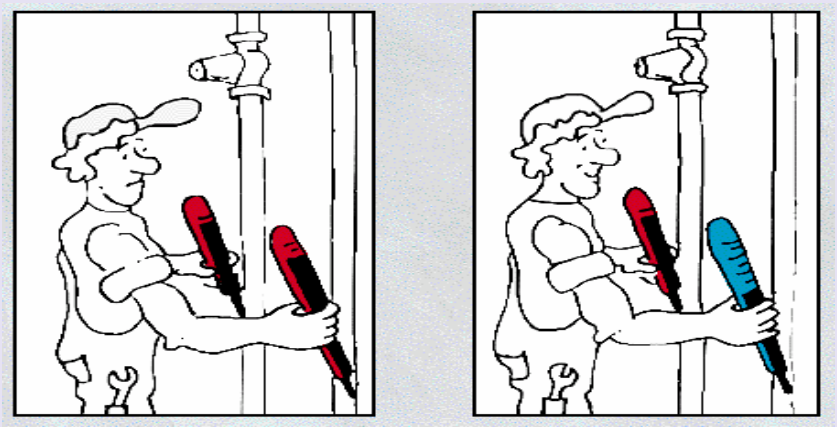
Incorrect volumetric flow leads to measurement and control problems



Only proper hydraulic balancing of the plant ensures optimum and stable control and adequate measurement accuracy in connection with heat meters

Problem / Reason 4

Excessive volumetric flow causes too small temperature differentials between flow and return



Plants in which high temperature differentials are mandatory call for suitable hydraulic concepts on the one hand and proper balancing of each plant section on the other. Without hydraulic balancing, such plants simply do not work

Problem / Reason 5
Energy saving

By balancing the System you can access a large energy saving potential (up to 20%)

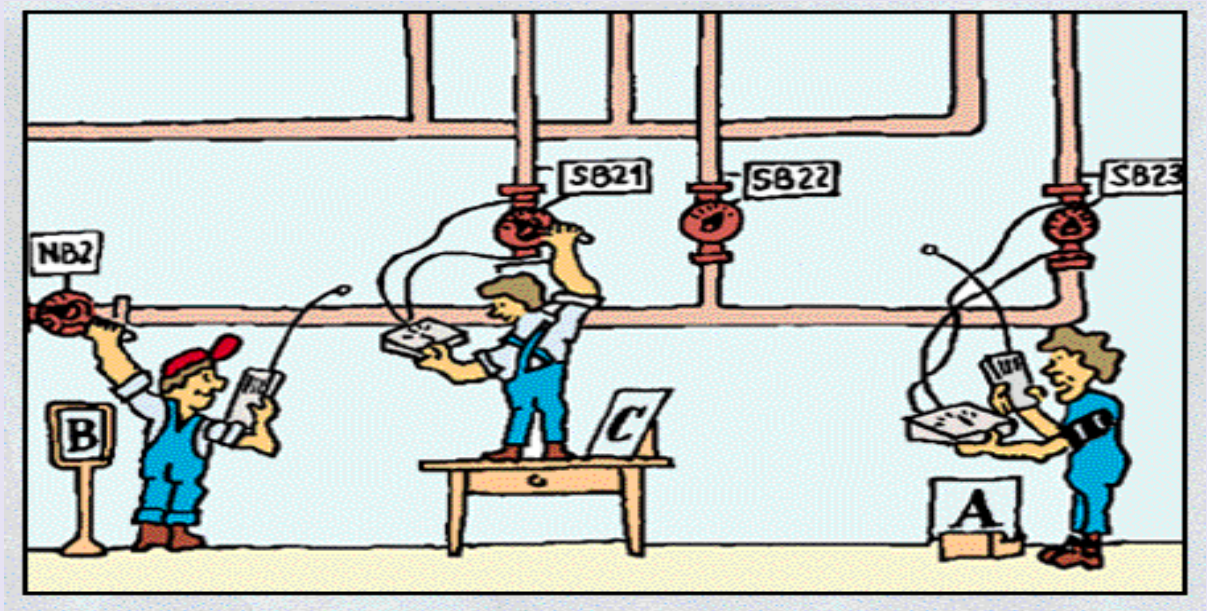
Control concept	Hydraulic balancing		
	poor	medium	good
Weather-compensated flow temperature control	120%	110%	100%
Weather-compensated flow temperature control with solar detectors depending on orientation of building	115%	105%	90%

Poor balancing: *Room temperature deviation up to 5°C*
Average balancing: *Room temperature deviation up to 2°C*
Good balancing: *Room temperature deviation up to 1°C*

How to get a well balanced system?

Solution 1

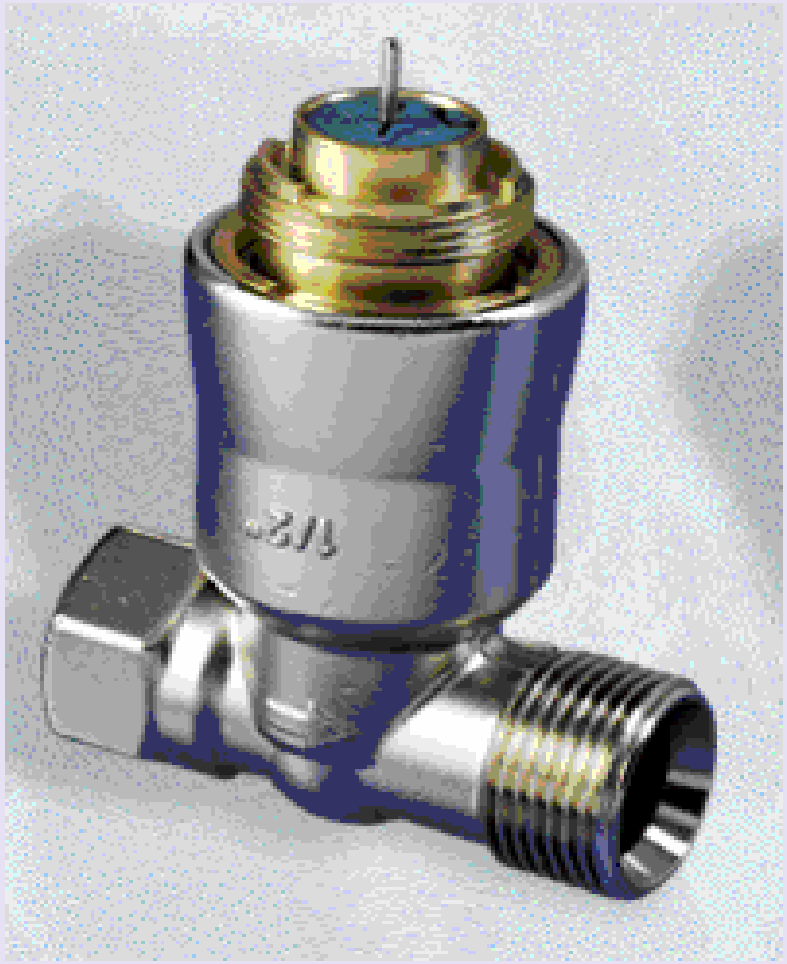
You invest in calculation work, time, money, riser balancing valves, patience, service work based on complains, …



or…

Solution 2

… you use MCV



We introduce…

The MiniCombiValve (MCV)

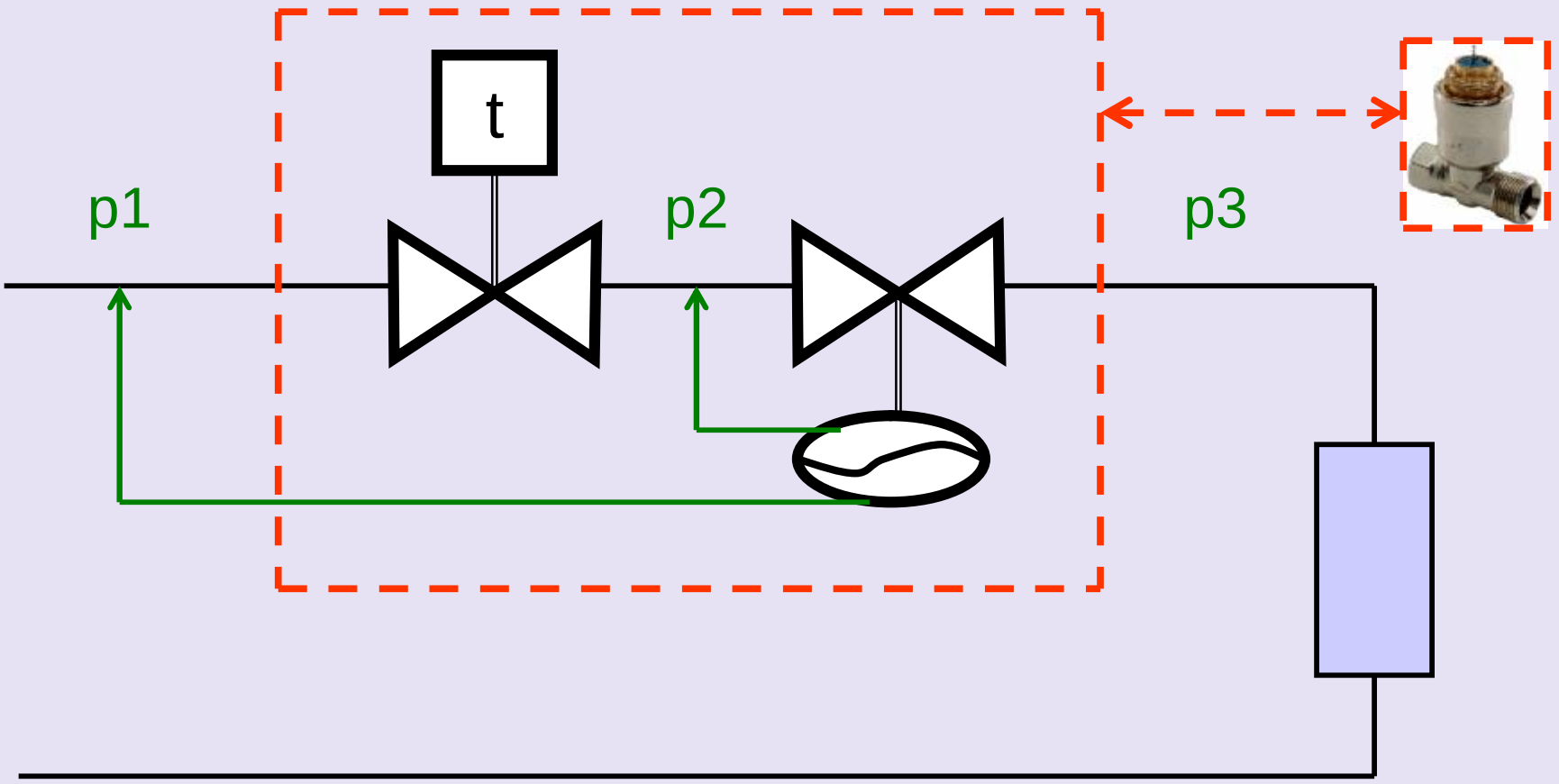
…a world novelty!

What is the Mini CombiValve ?

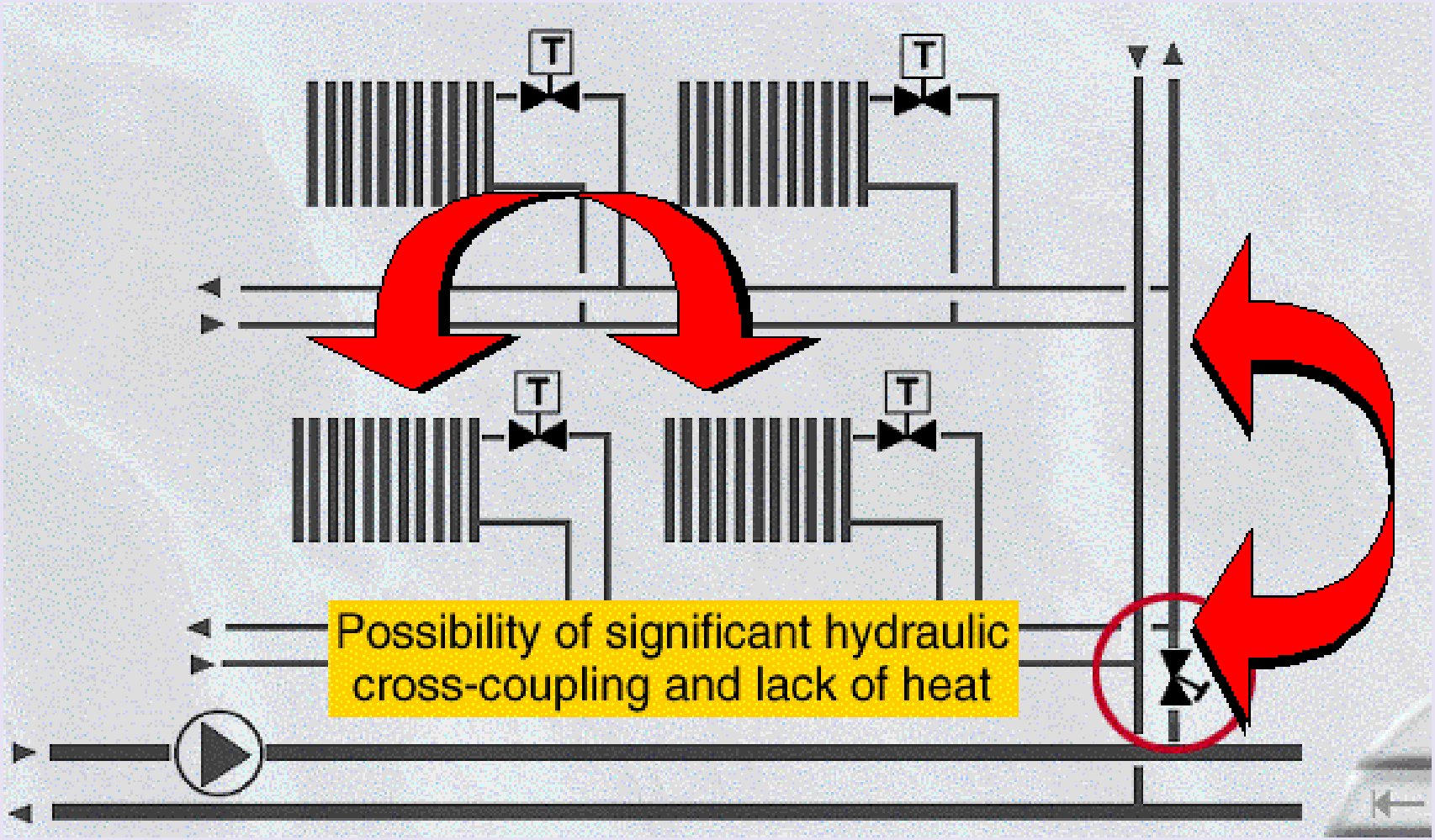
… A radiator valve with integrated differential pressure control, that ensures optimum flow limitation under all operating conditions according to your required and preset value

… A solution with worldwide patent protection

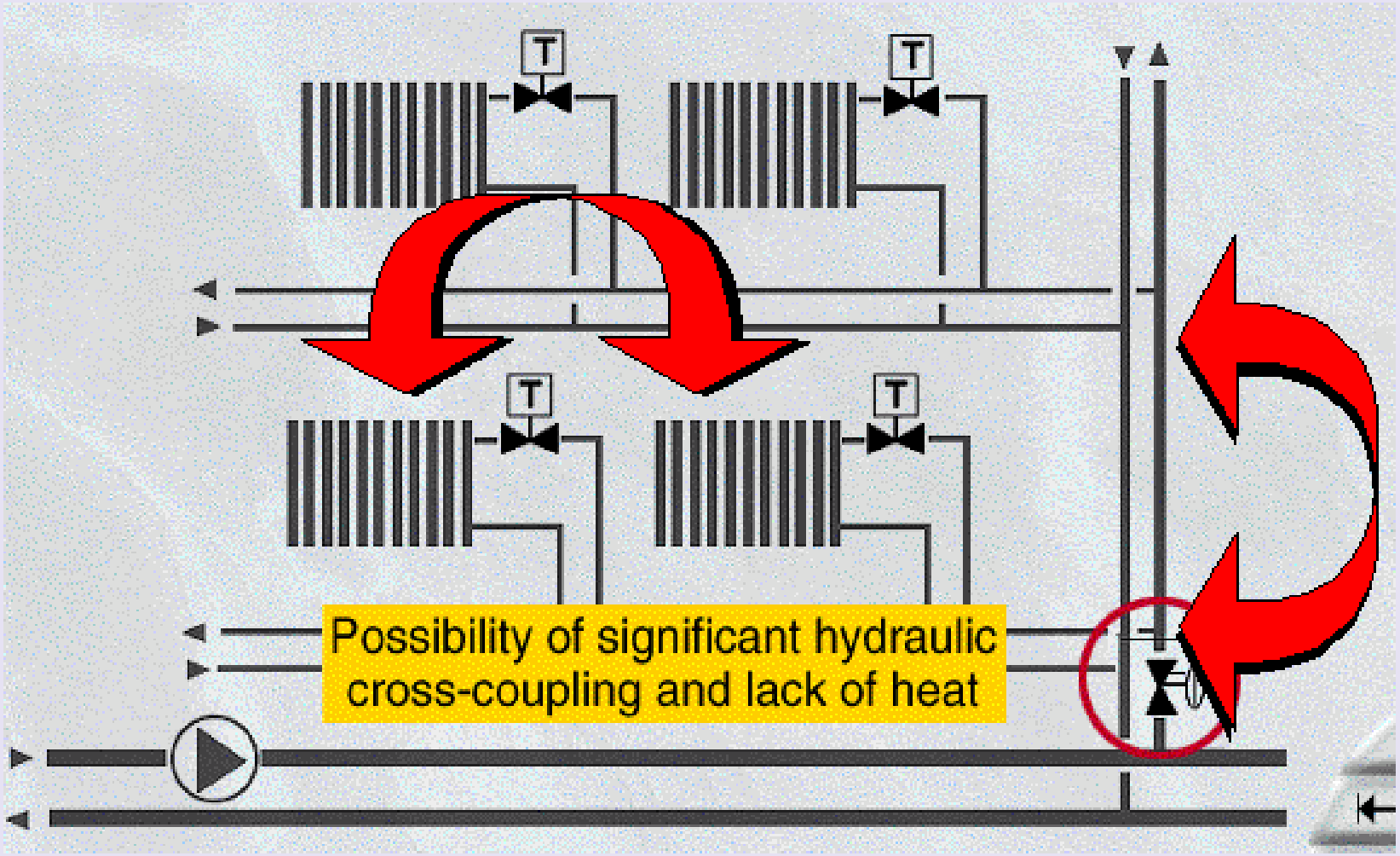
What is inside the Mini CombiValve ?



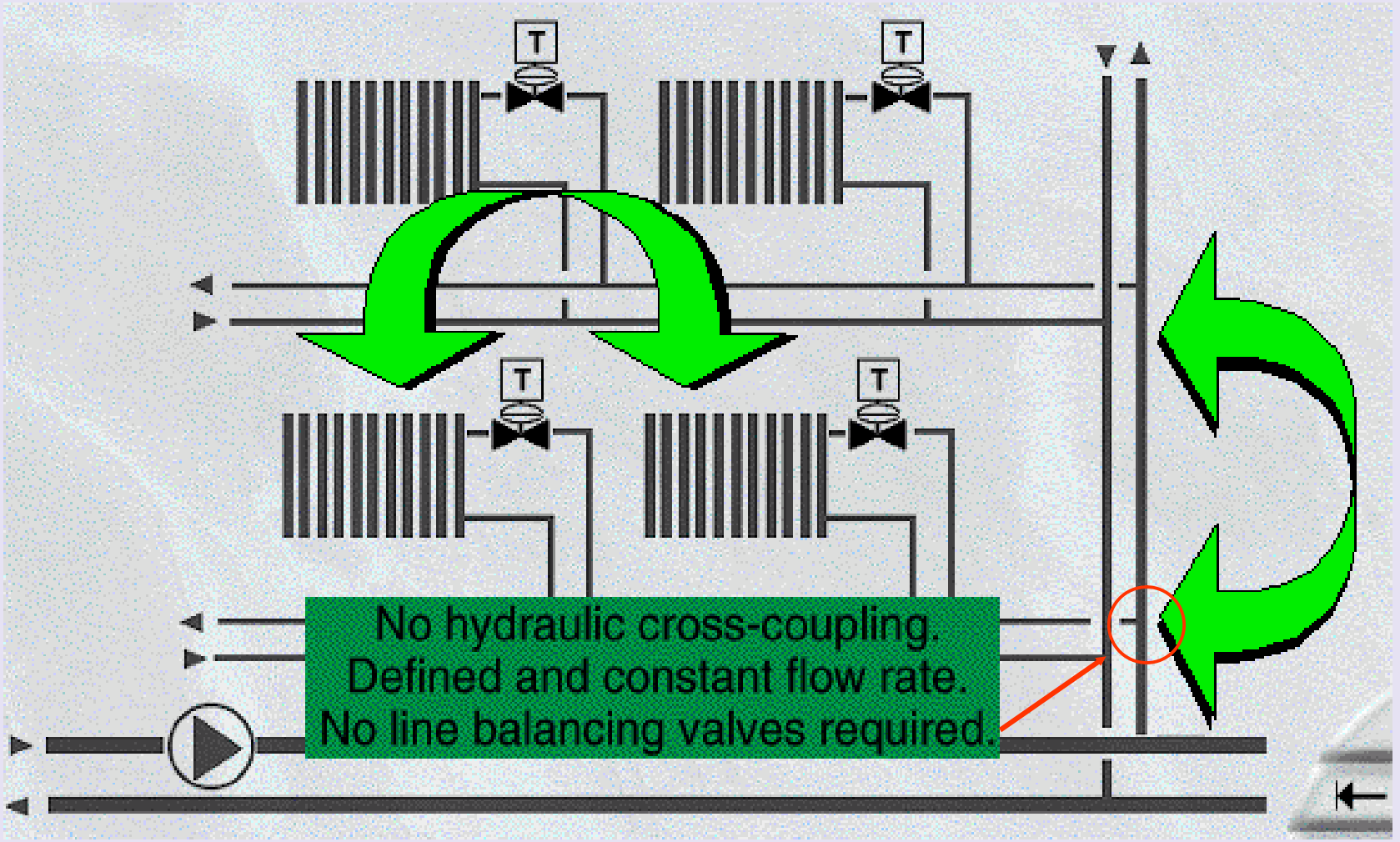
1. Conventional System with manual riser balancing valves



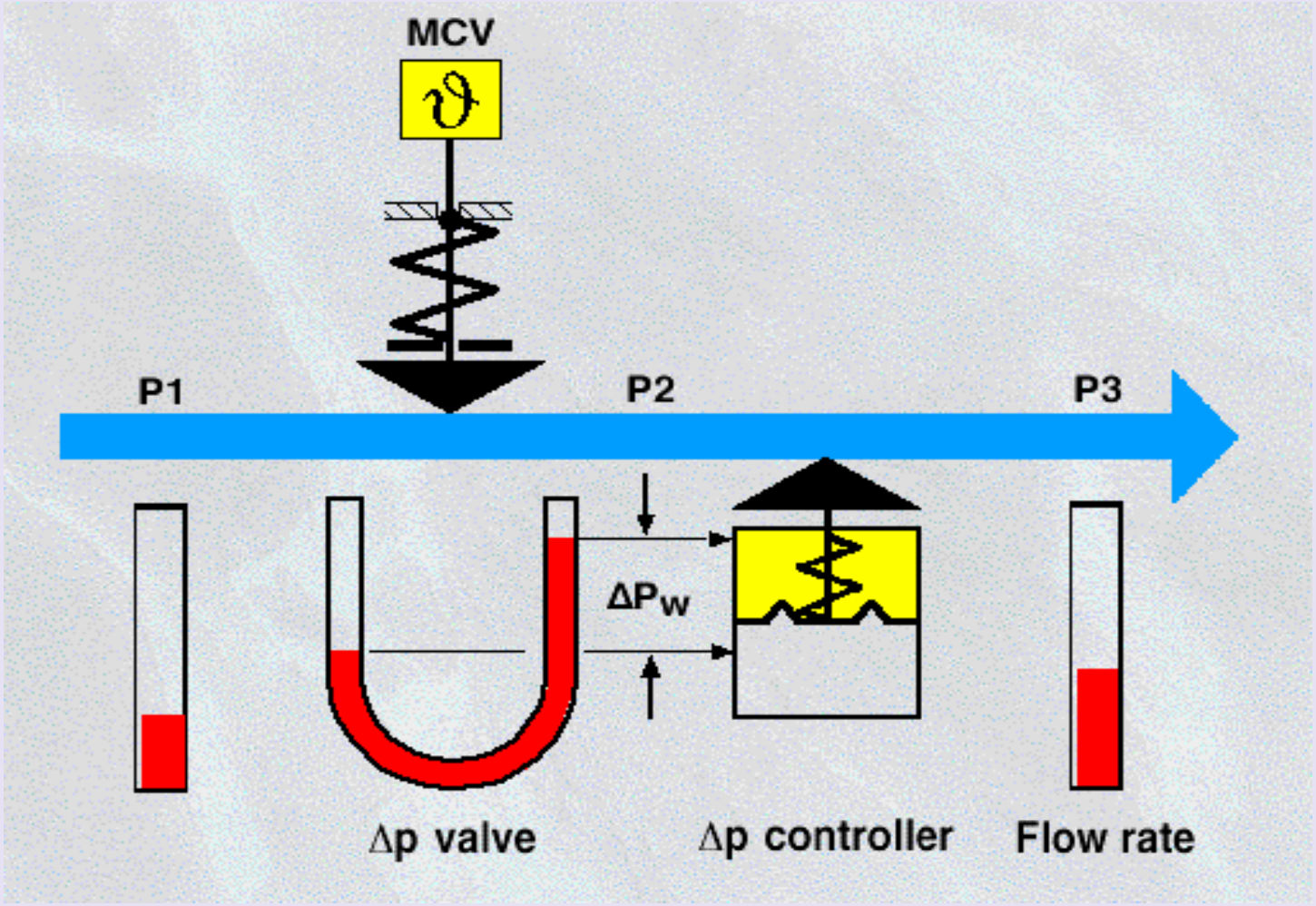
2. Conventional System with automatic riser balancing valves



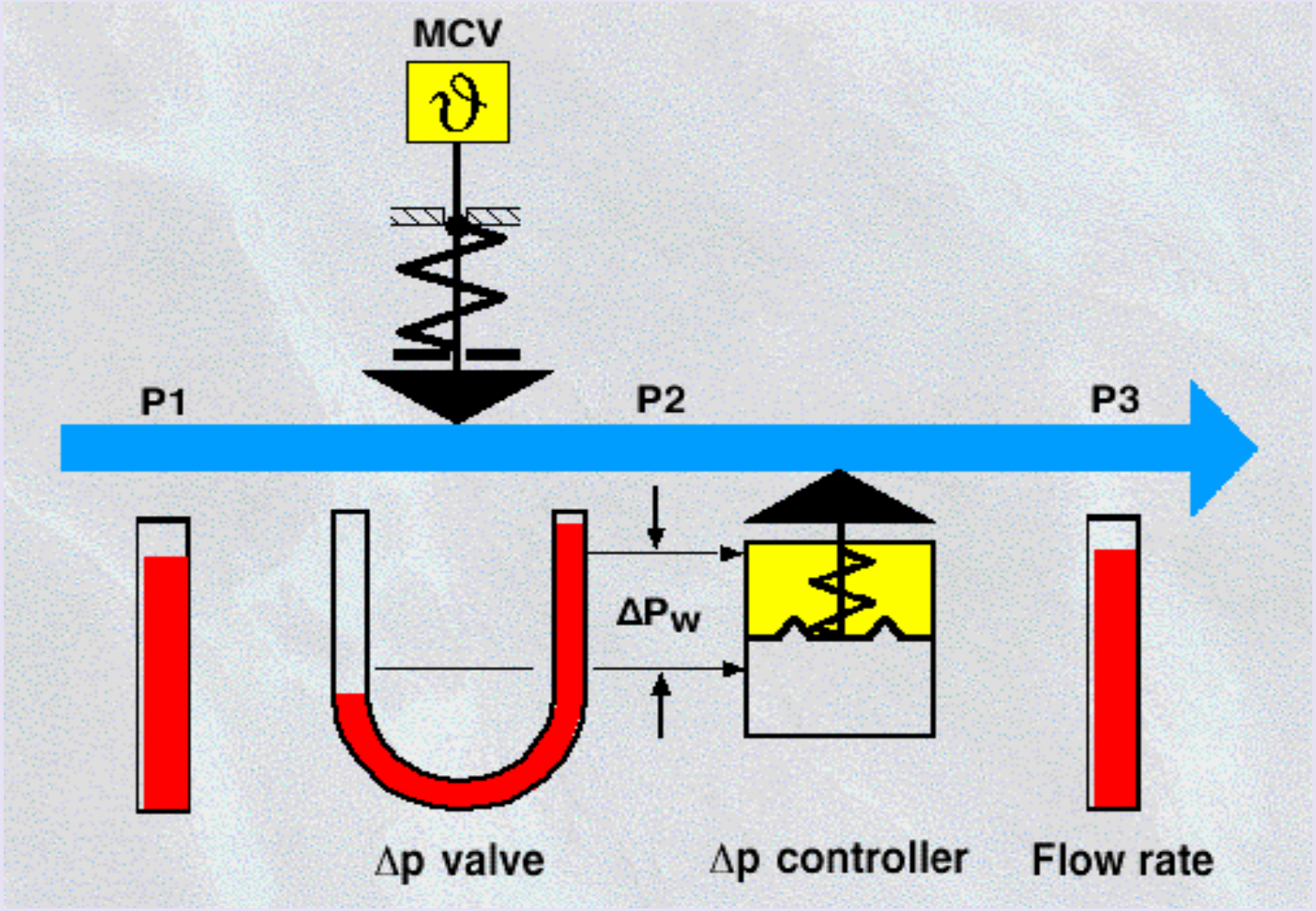
3. MCV System


T
T
T
T
No hydraulic cross-coupling.
Defined and constant flow rate.
No line balancing valves required.

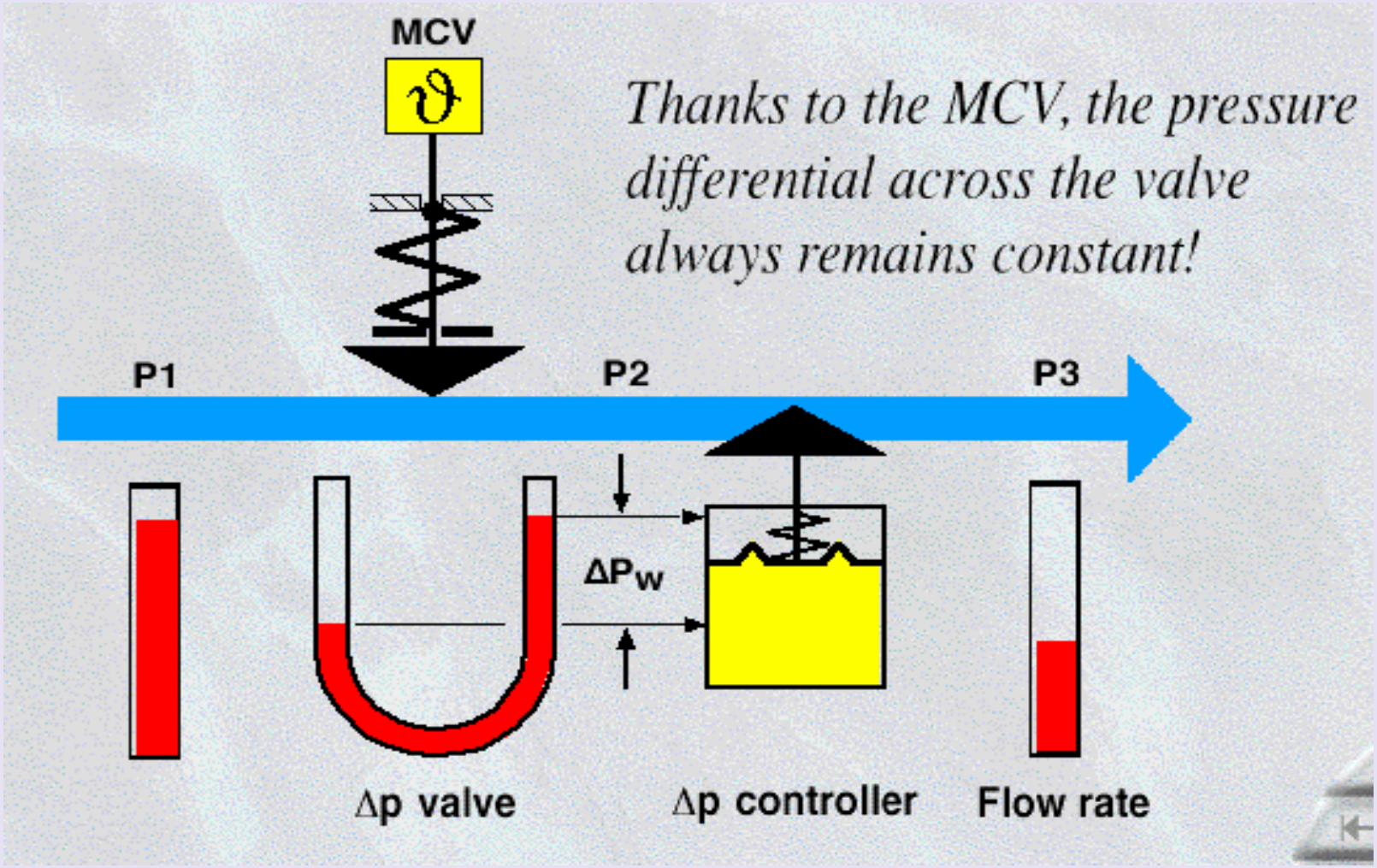
What happens when the pressure before the valve increases ?



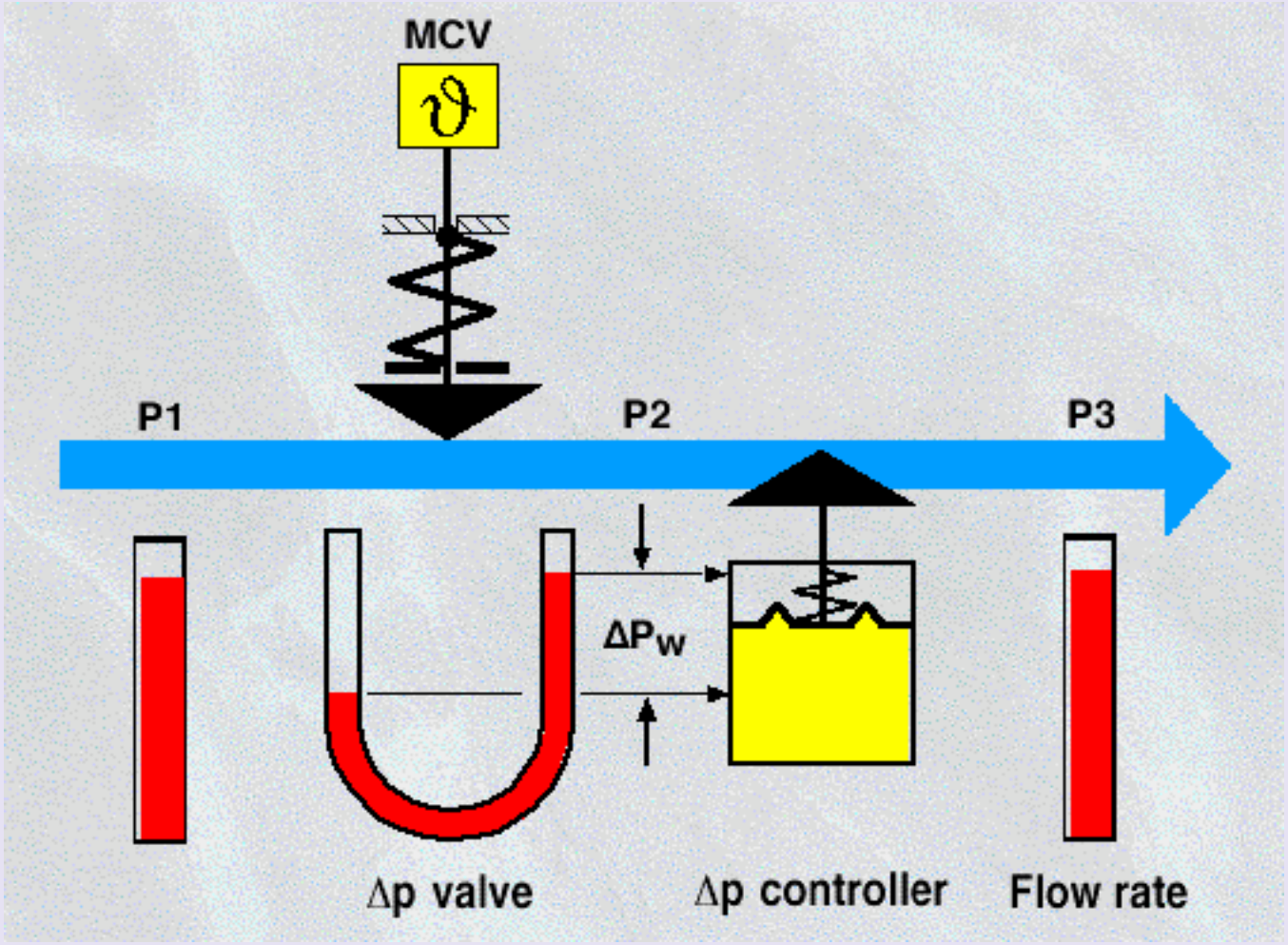
… the differential pressure increases, the volumetric flow rises and it gets warmer



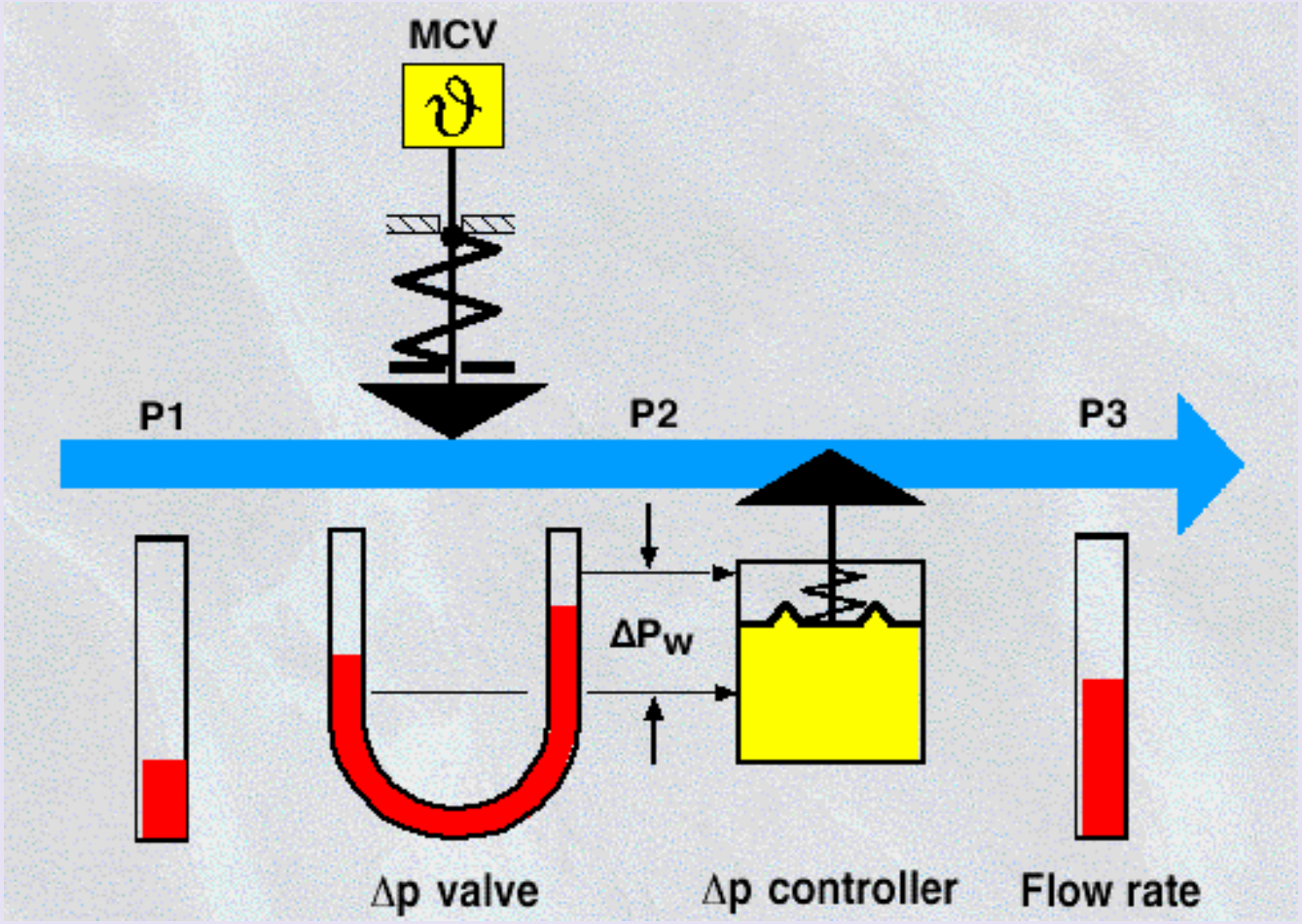
…differential pressure controller closes and the desired flow is reached again.



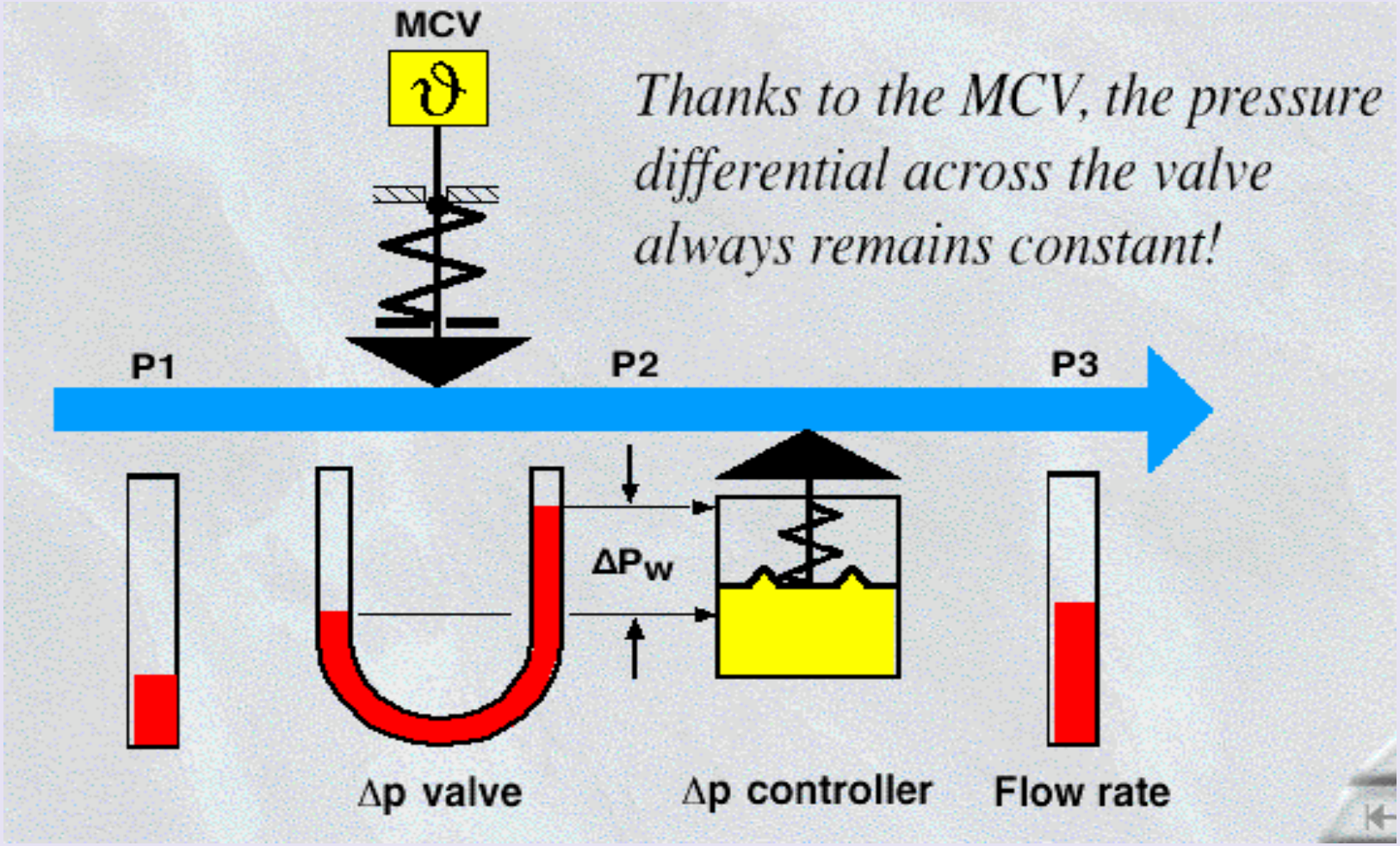
What happens when the pressure before the valve decreases ?



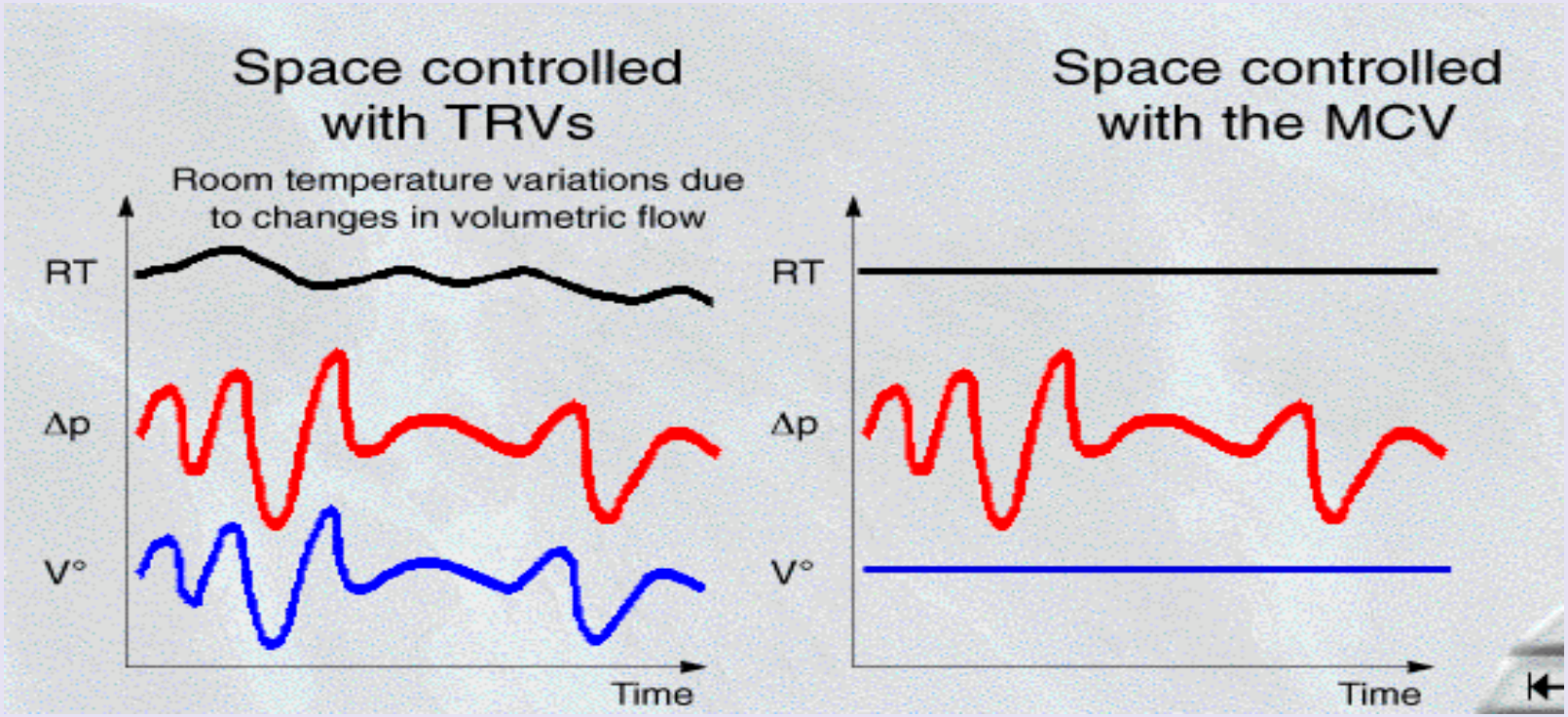
…the differential pressure decreases, the volumetric flow decreases and it gets



…differential pressure controller opens and the desired flow is reached again.



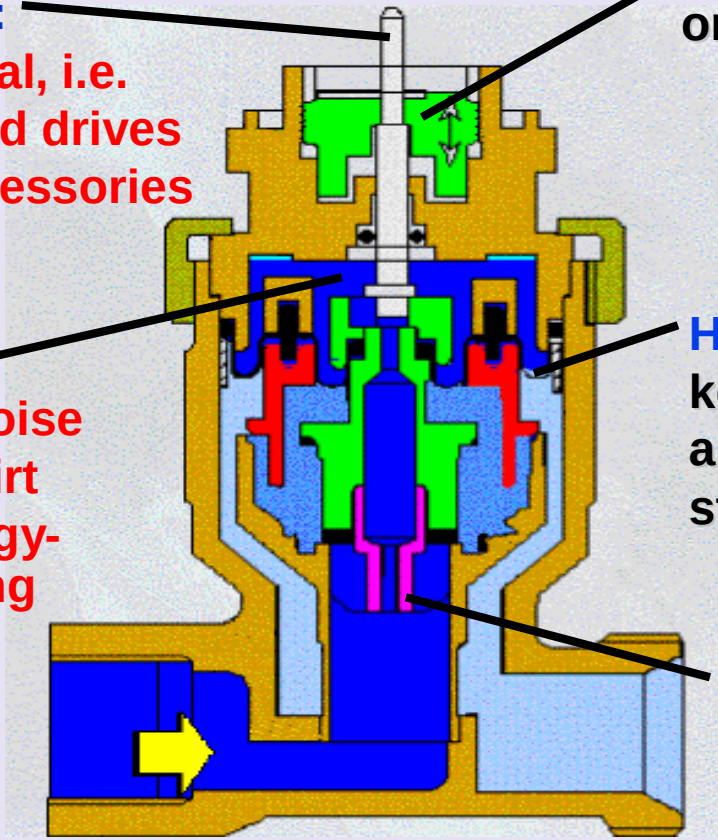
Room temperature TRV versus MCV



Functions

Spindle for 2.5mm stroke:
for electric or thermostatic actuators Þ universal, i.e. standard drives and accessories

Pressure compensation:
low flow speed Þ no noise
Þ no dirt
consumption according to need Þ energy-saving

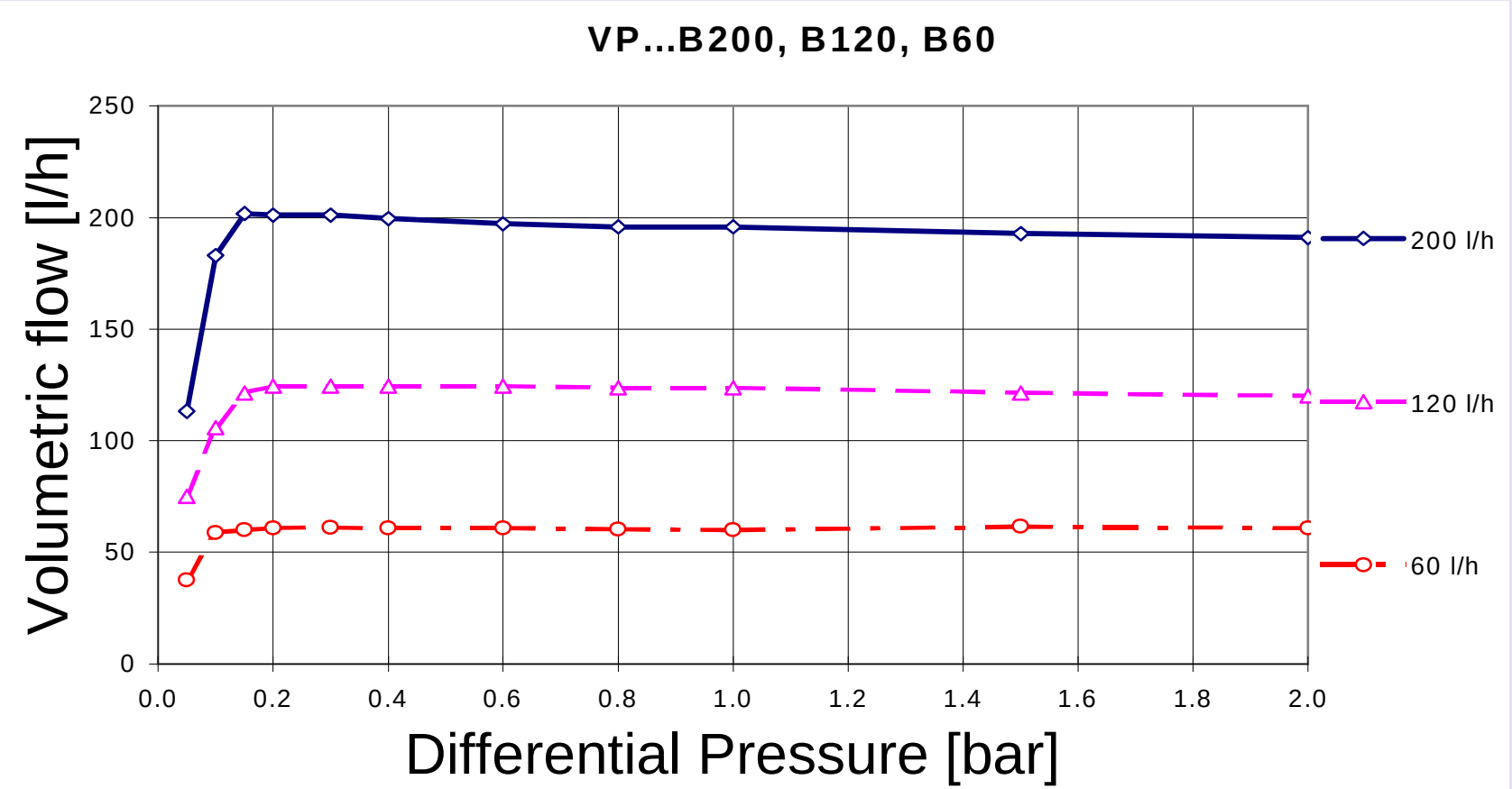


Adjustment ring:
once adjusted Þ constant pressure, thus comfort, for ever
Þ no servicing

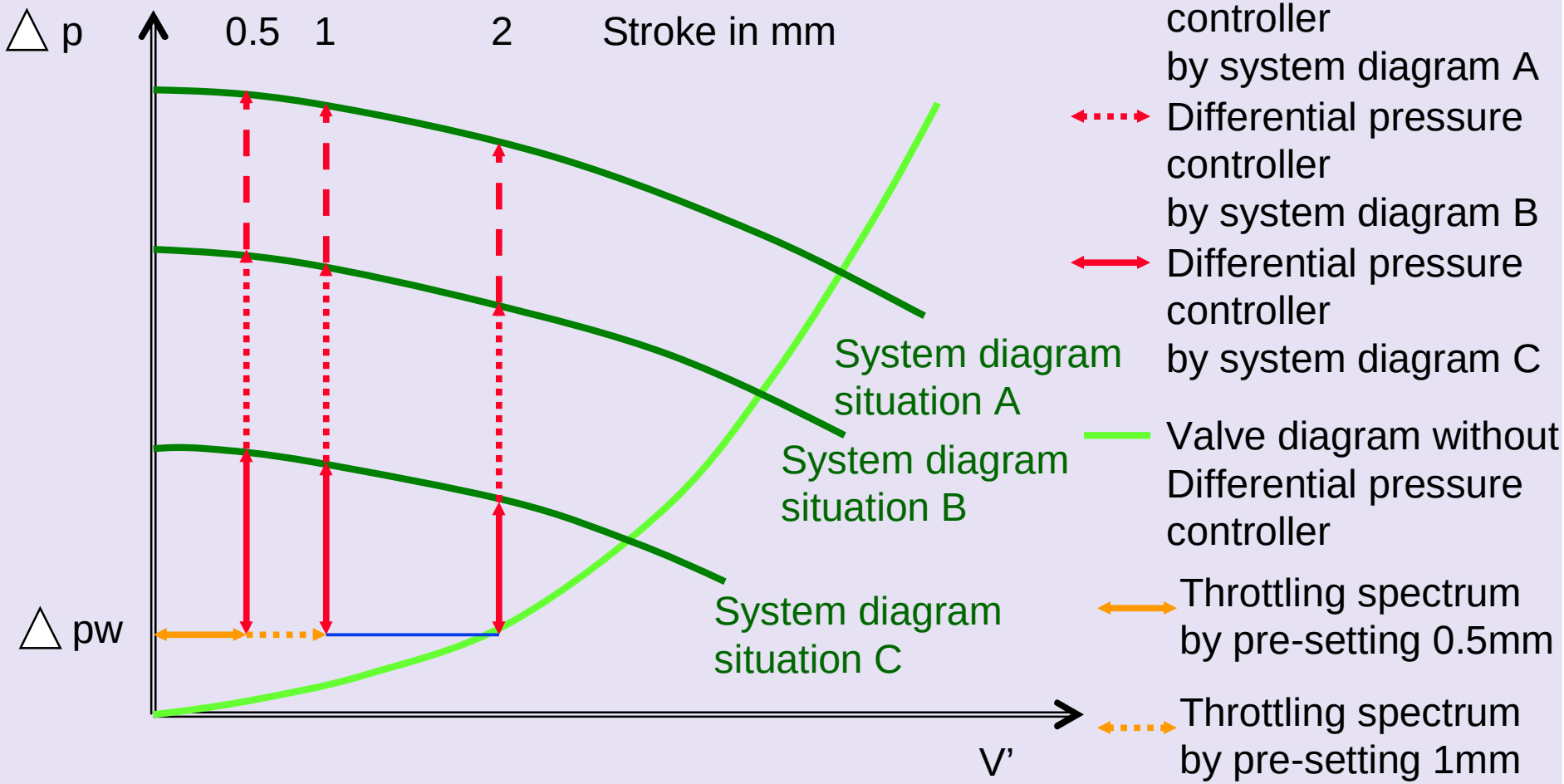
High-quality membrane:
keeps pressure and flow constant Þ equal comfort for everybody
Þ reduces energy consumption

Valve cone:
controls flow individually according to need Þ immediate comfort
Þ at low energy cost

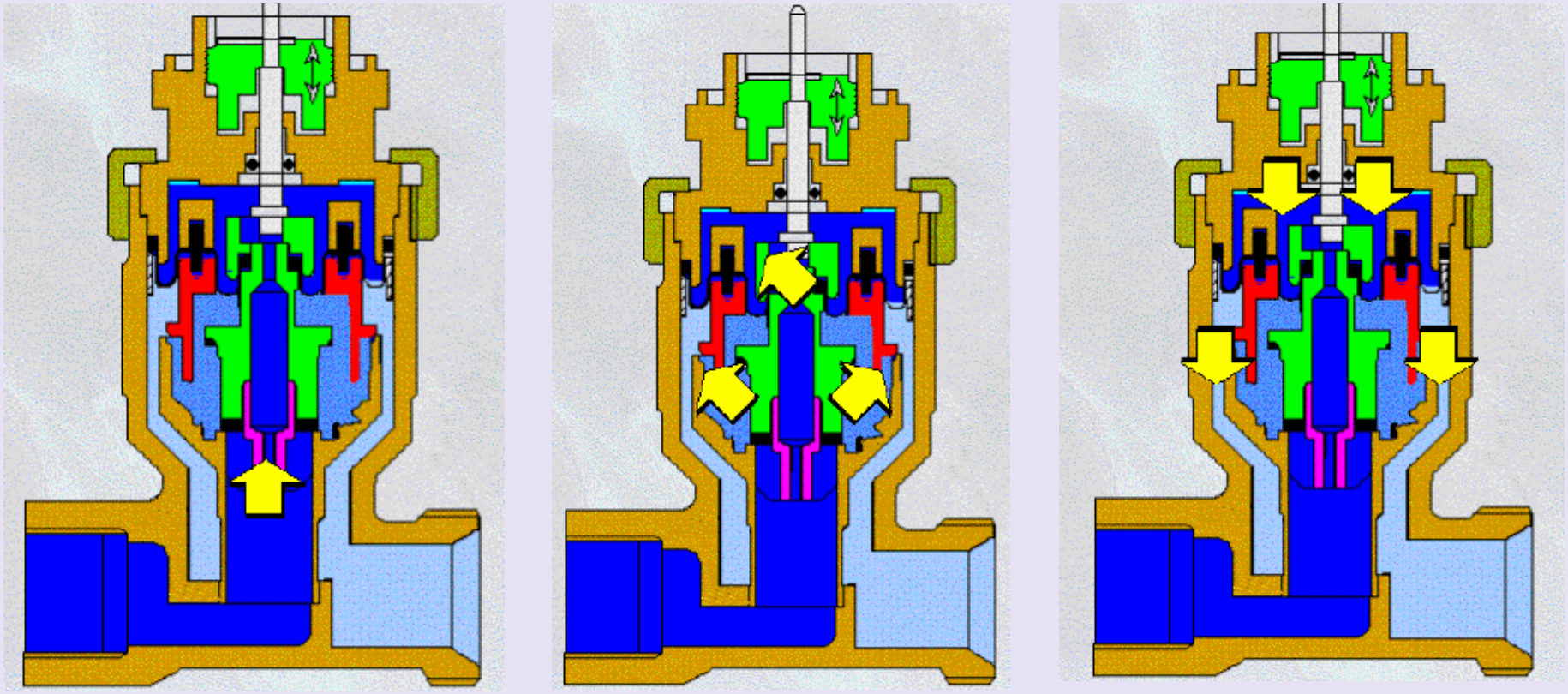
Diagrams


VP...B200, B120, B60
Volumetric flow [l/h]
250
200
150
100
50
0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Differential Pressure [bar]
200 l/h
120 l/h
60 l/h

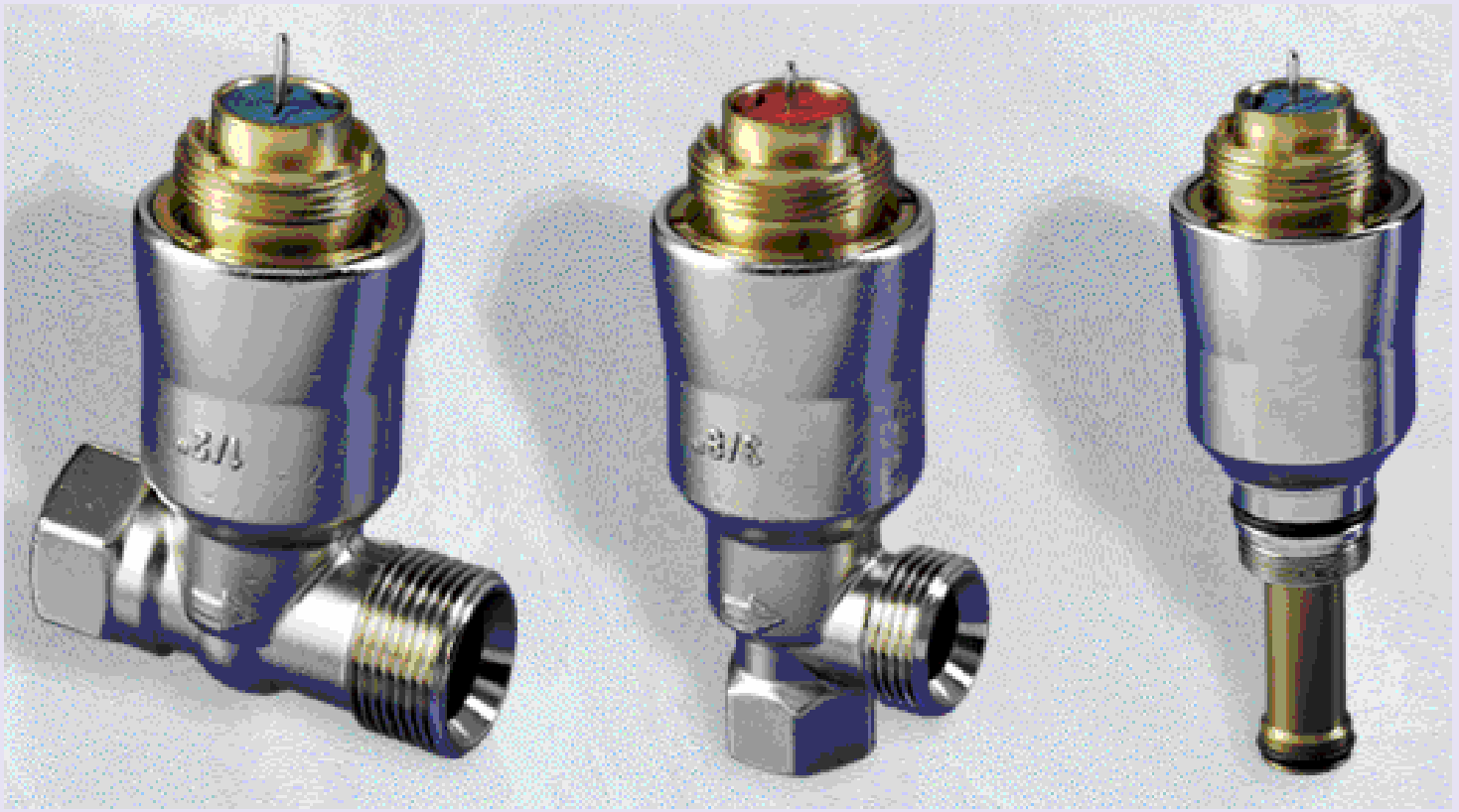
Function Diagram



Working principle



Types



straight valve 3/8”,1/2”-DIN,NF

Angle valve 3/8”,1/2”-DIN,NF

OEM-insert valve

Type designation

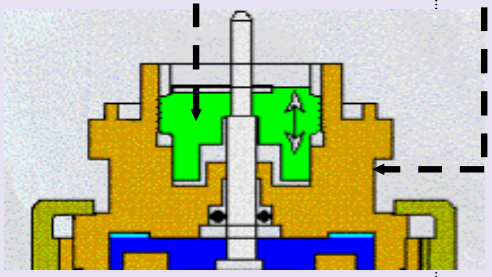
VP□ □ A-45 □	è	*adjustment ring* **blue** *letter* A
VP□ □ B-60 □	è	*adjustment ring* **blue** *letter* B
VP□ □ A-90 □	è	*adjustment ring* **red** *letter* A
VP□ □ B-120 □	è	*adjustment ring* **red** *letter* B
VP□ □ A-145 □	è	*adjustment ring* **pink** *letter* A
VP□ □ B-200 □	è	*adjustment ring* **pink** *letter* B

-0 means no Stop Drop

10 = 3/8“, 15 = 1/2“

1 = DIN, 2 = NF

D = straight, E = angle



Type overview (straight valves)

Presetting 3

	DN mm	DN inch	Type reference Version DIN	Type reference Version NF	Δpv bar	Δpmin bar	kv at a stroke of 0.5 mm l/h
A	10	3/8	VPD110A-45	VPD210A-45	0.05	0.06	45
	10	3/8	VPD110A-90	VPD210A-90	0.05	0.08	90
	10	3/8	VPD110A-145	VPD210A-145	0.05	0.10	145
	15	1/2	VPD115A-45	VPD215A-45	0.05	0.06	45
	15	1/2	VPD115A-90	VPD215A-90	0.05	0.08	90
	15	1/2	VPD115A-145	VPD215A-145	0.05	0.10	145
B	10	3/8	VPD110B-60	VPD210B-60	0.10	0.14	60
	10	3/8	VPD110B-120	VPD210B-120	0.10	0.17	120
	10	3/8	VPD110B-200	VPD210B-200	0.10	0.20	200
	15	1/2	VPD115B-60	VPD215B-60	0.10	0.14	60
	15	1/2	VPD115B-120	VPE215B-120	0.10	0.17	120
	15	1/2	VPE115B-200	VPD215B-200	0.10	0.20	200

Combinations










Sizing
As easy as 1-2-3

1. Calculate - as usual - the **energy need**

2. Define - as usual - the **volumetric flow**

$$V' = \frac{Q}{c \cdot \Delta t} = \left[\frac{W}{J/kg \cdot K \cdot \Delta K} \cdot 3600 = \frac{kg}{h} \cong \frac{l}{h} \right]$$

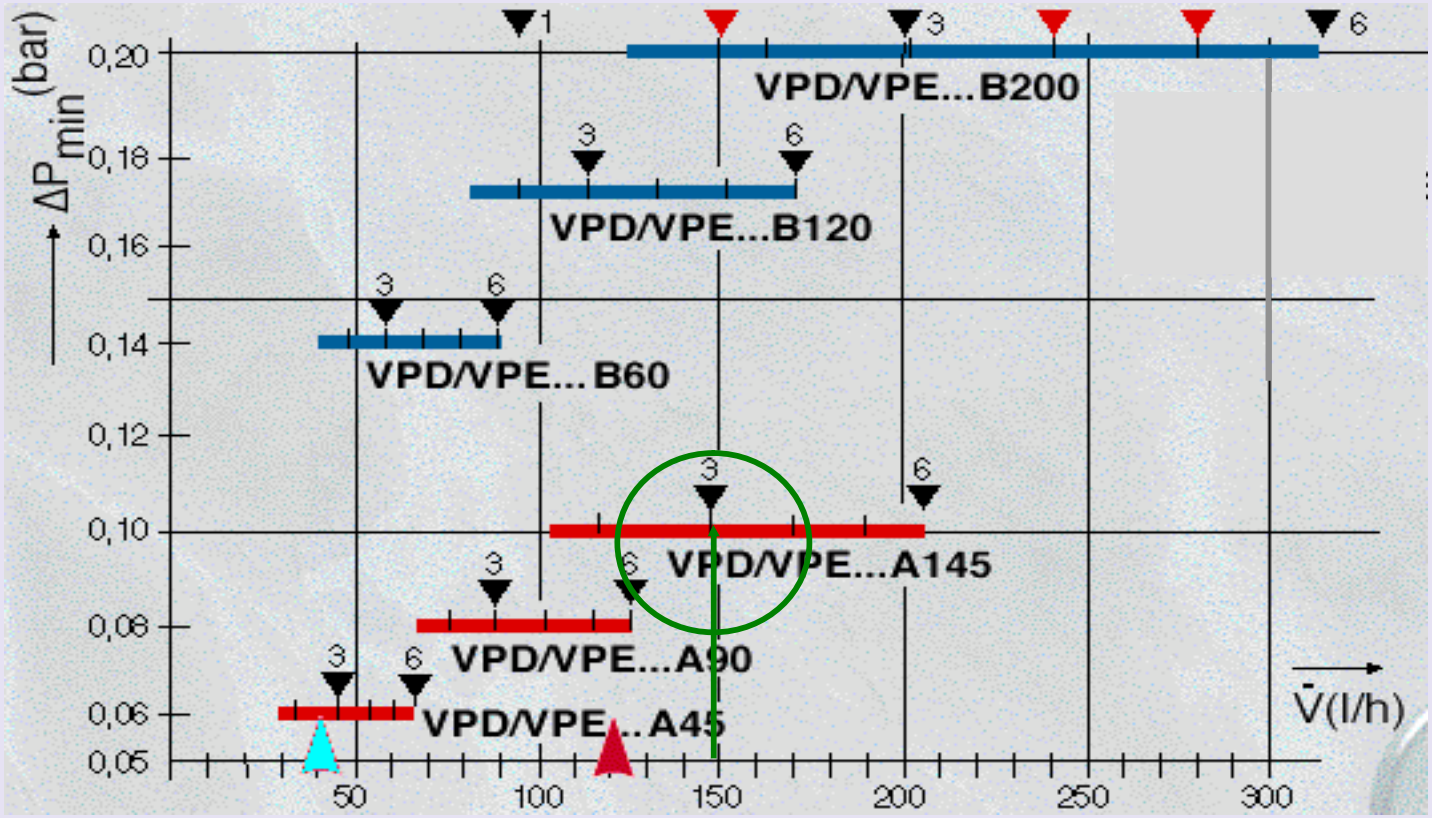
V' = volumetric flow in [kg/h or l/h]
c = specific heat capacity in [J/kg*K] or [cal/kg*K]
Δt = temperature difference in [K]
Q = energy need in [W] or [cal/h]

Sizing

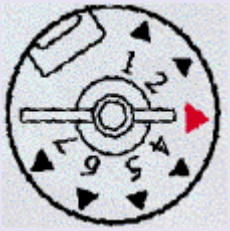
As easy as 1-2-3

3. Search the intersection of volumetric flow and number 3

Example: 150l/h gives a VPD/VPE…A145

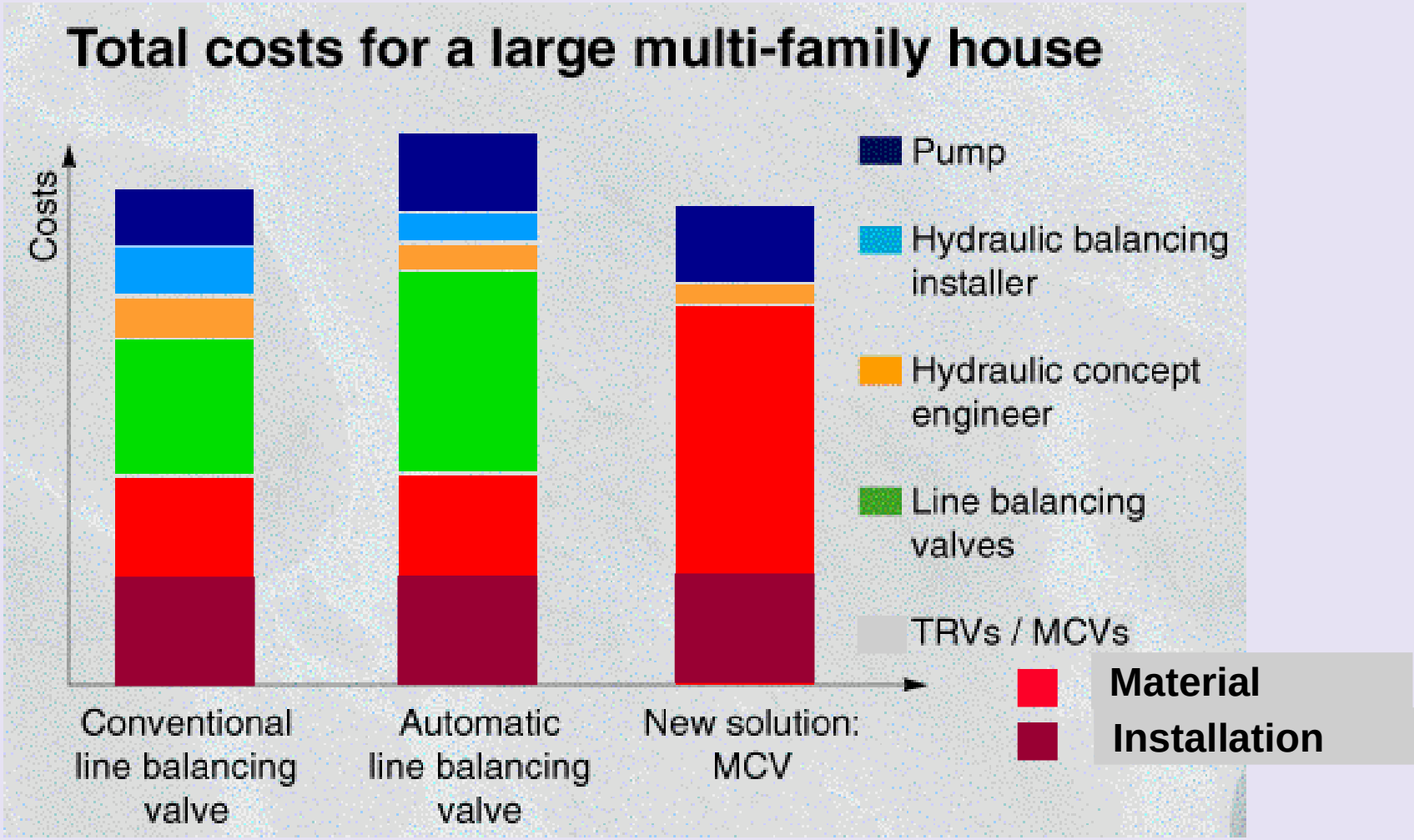


Adjustment



stroke in mm	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	2
reference number	1	2	3	4	5	6	7											
reference number + 360°											1	2	3	4	5	6	7	
Typ	V' [l/h]																	
VPD/VPE...**A-45** (blue)	25	36	45	53	60	67	72	77	81	85	88	91	93	96	98	100	102	104
VPD/VPE...**B-60** (blue)	31	47	60	71	81	89	96	102	106	110	114	117	120	122	124	127	129	132
VPD/VPE...**A-90** (red)	57	75	90	103	114	123	132	139	145	151	156	160	165	169	173	177	181	185
VPD/VPE...**B-120** (red)	67	96	120	141	158	173	186	197	206	214	221	228	234	240	246	252	257	263
VPD/VPE...**A-145** (pink)	86	117	145	169	189	207	223	236	248	258	267	276	284	291	298	305	311	318
VPD/VPE...**B-200** (pink)	95	151	200	243	280	311	339	362	383	400	415	428	439	450	459	467	475	483

Investment


Total costs for a large multi-family house
Costs
Pump
Hydraulic balancing installer
Hydraulic concept engineer
Line balancing valves
TRVs / MCVs
Material
Installation
Conventional line balancing valve
Automatic line balancing valve
New solution: MCV

Customer benefits
End user

- **Total comfort** because of constant room temperature and no temperature variance
- **Reduced investment costs** for apartment and house owners
- **Lower operating costs**
- Guaranteed **no flow noise**
- Elimination of **service cost**
- Perfect **water distribution in the morning** after the night reduction

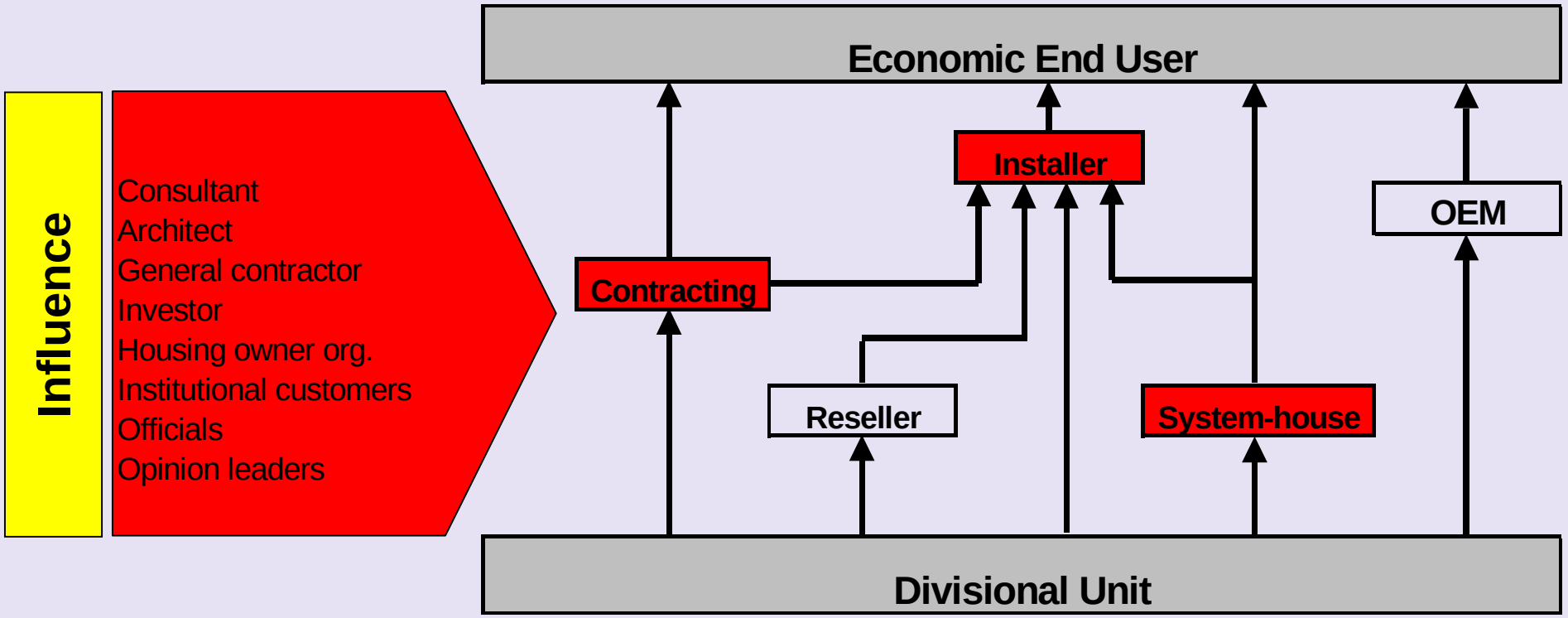
Customer benefits
Installers

- **No** additional **line balancing valve** required
- **No hydraulic balancing** required
- Each radiator supplies a **defined amount of heat**
- Ideal solution **for retrofitting** of old plants in renovation projects
- **No time** investment to solve hydraulic problems
- no service work - ***Install and forget !***
- Stick out as **problem solver**

Customer benefits
Engineers

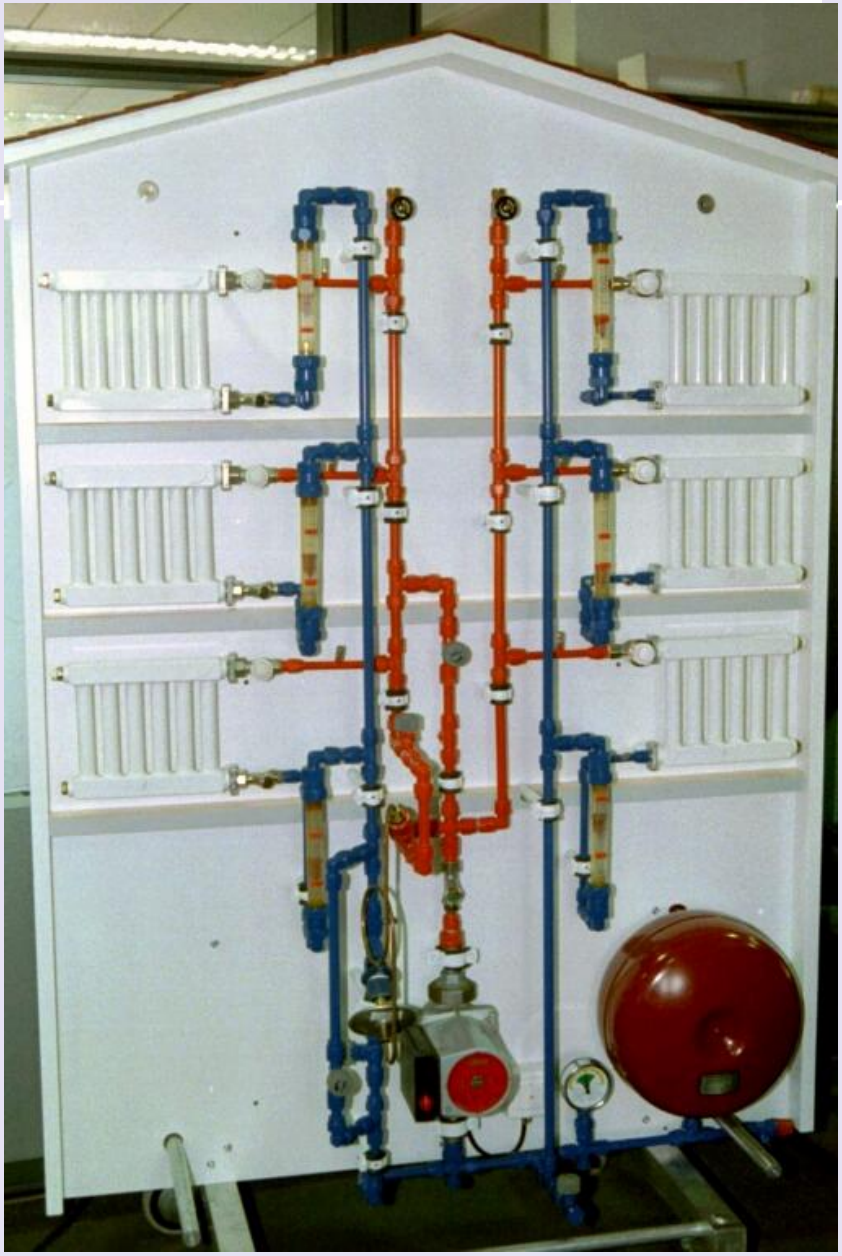
- **Minimized** planning time
- **Accurate planning** based on calculated head requirements
- **Safety margin** can be minimized
- **No time engegement** to solve hydraulic problems
- The plant is definitely **always perfectly balanced**
- **Perfect pressure control regulation** of the pump
- Get your innovative profile thanks to **new technique**
- Stick out as **problem solver**

Targeted Channels and influencing parties:



Marketing Tools available

- è Reference List
- è Argumentation List
- è Sizing Manual
- è Data sheet
- è Cut demonstration model
- è Demo House
- è Submission text
- è Diverse Press articles
- è Flyer I and II
- è Economical calculation
- è Presentation
- è Interactive CD



In summary: MCV ...

… is not just another radiator valve:

- thanks to the differential pressure controller it is a complete hydraulic solution.
- it is robust, reliable and did pass tough and extensive long term tests.
- and it saves **time, pain** and especially **money**.

Applications of MCV ...

… with motoric actuator SSA, ...

… or with thermostatic controller and remote sensor RT76