

ART. 2136



ART. 2137



1 DESCRIPTION

The valves art. **2136** and **2137**, better known by the acronym **PICV** (**P**ressure **I**ndependent **C**ontrol **V**alve), have been designed for the automatic balancing of heating, cooling and sanitary systems, regardless of pressure fluctuations.

The main features of the control valves are the following:

- Range of differential pressures between a minimum value of 16 kPa and a maximum value of 400 kPa;
- Possibility to quickly connect the pair of pressure plugs art. **2140**;
- Selector with graduated scale with 21 settings to select the required flow;
- Automatic balancing in case of pressure fluctuation in the system pipelines;
- Interception of flow rate by the actuators art. **2138** and **2139**;
- Flexibility of application in case the system is modified after the initial installation;
- Reduced balancing costs, energy saving and improved comfort.

2 WORKING PRINCIPLE

The Pressure Independent Control Valves enable three separate functions in a system:

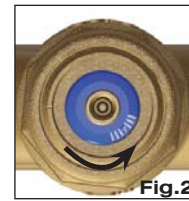
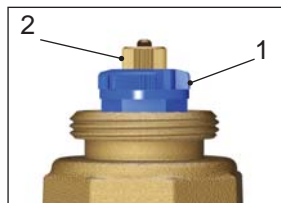
- **Adjustment.** Select the flow rate within the operating range.
- **Control.** Maintain a constant flow rate even in case of variable pressure.
- **Interception.** Interception of the flow by means of actuators.

2.1 REGULATION

The Pressure Independent Control Valves allow to select the flow within the working range.

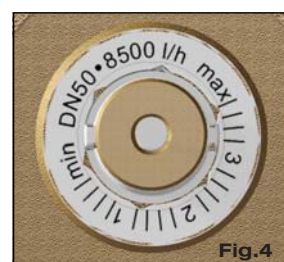
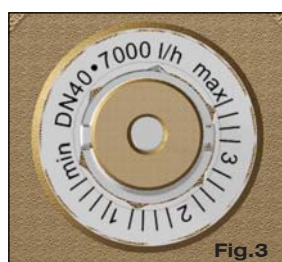
The valve art. **2136** has a working range from 1 to 5, but then there is the possibility to select 21 different regulations, in order to have the required flow rate value.

By turning the adjusting nut (1) you get the design flow rate value (Pictures 1 and 2). Then tighten the memory block (2).



The valve art. **2137** has a working range from 0,5 to 4; the required flow rate value can be selected within this range.

You can see the graduated selector for the setting of 1"1/2 and 2" valves in pictures 3 and 4.



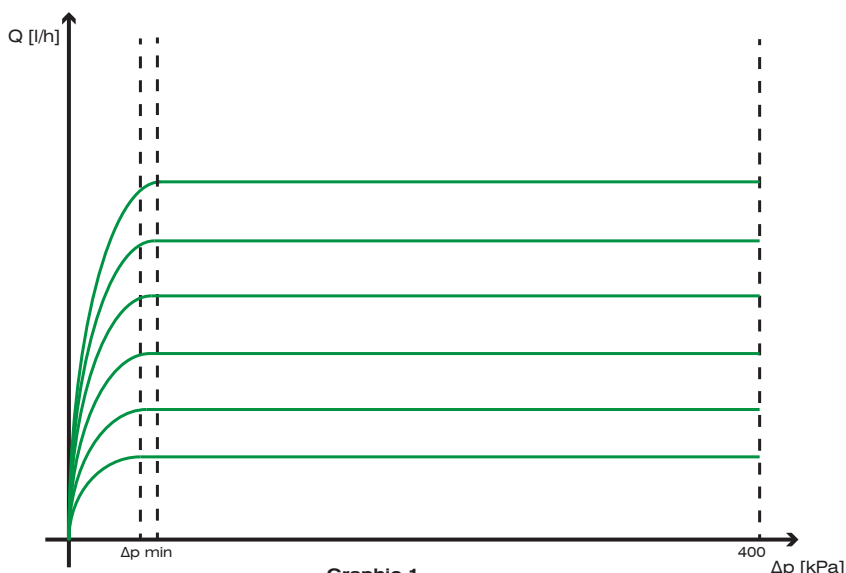
2.2 CONTROL

The Pressure Independent Control Valves keep the same flow rate regardless of pressure fluctuations.

The control of this parameter is done by monitoring two pressure jumps within the valve. The first Δp is between the inlet pressure and the one within the valve; the second pressure differential is between the pressure within the valve and the outlet one. Keeping the last value constant, the required flow rate is maintained to the various outlets.

Graphic 1 shows the flow rate trend at different Δp , as per the various positions of the presetting valve.

Excluding the first part with low Δp values, the flow rate remains constant between the minimum Δp (which varies from 13 and 32 kPa according to the model) and the 400 kPa of the differential pressure maximum value.



2.3 INTERCEPTION

It is possible to intercept the flow by installing the actuators art. **2138** and **2139** on the balancing valves art. **2136** and **2137** and closing the flow of the system where the valve is installed

ART. 2138



Thermoelectric actuator for valve art. 2136



ACTUATOR TECHNICAL FEATURES	
Voltage	230V AC
Control	ON/OFF - N.C.
Frequency	50/60 Hz
Opening time	180s
Class of protection	IP54
Actuator stroke	4mm
Actuating force	160N
Cable lenght	1 m
Connection	M30x1,5
Weight	200 g

The actuator art. **2138** has a threaded nut M30x1,5 which allows the installation directly on the body of the valve art. **2136**, after having removed the cap.

ART. 2139



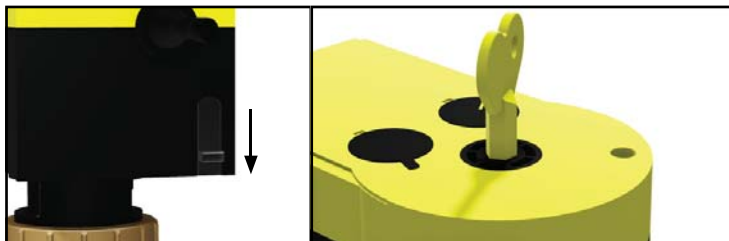
Electric actuator for valve art. 2137

ACTUATOR TECHNICAL FEATURES	
Voltage	230V AC
Control	2/3 positions
Frequency	50/60 Hz
Opening time	120s
Class of protection	IP54
Actuator stroke	8mm
Actuating force	500N
Cable lenght	1,2 m
Connection	M30x1,5
Weight	700 g

In order to fix the actuator art. **2139** on the valve **2137** it is necessary to use a brass adapter supplied with the actuator, to be screwed in after removing the cap, as shown in the pictures below

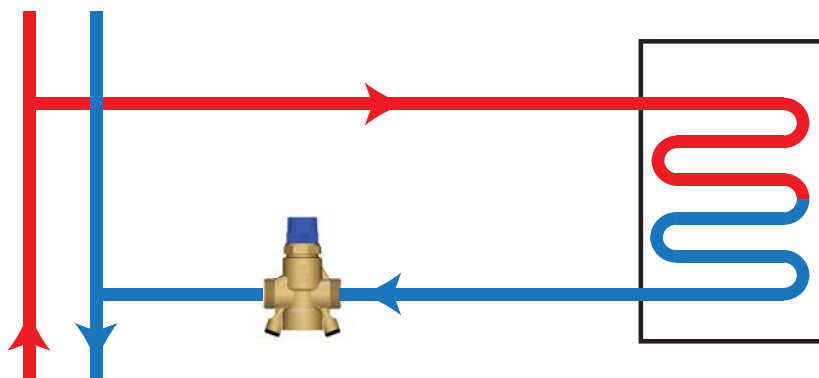


For the engine manual release it is necessary to lower the small switch and then turn the hexagonal key placed in the proper hole.



3 APPLICATIONS

The valves art. **2136** and **2137** are used for flow rate balancing in systems with hydraulic separators, fan coils, radiant panels, air handling units and systems with chilled beams. The valve is suitable for cases where it is necessary to keep a constant flow to feed a heating or a cooling terminal, in order to always maintain the design values, even with varying system load conditions.



4 MEASUREMENT DEVICES

To balance the system it is necessary to adjust every single valve on the presetting value corresponding to the required flow rate. The presetting values shown in the instruction sheets can be used to adjust the FAR balancing valves art. **2136** and **2137**. All the PICV models are equipped with a measurement device suitable to be connected to an electronic instrument, art. **2125**, which allows to make immediate measurements on the fluid circulating within the valve. It is necessary to use the pair of pressure plugs with quick coupling art. **2140** in order to connect the electronic instrument to the valve.



5 TECHNICAL FEATURES

Max. nominal pressure: 25 bar
 Max. differential pressure: 4 bar
 Max. temperature: 120°C
 Min. temperature: -10°C
 Compatible fluids: water, water with glycol
 Body: EN 12615 - CW602N "CR" brass
 Gaskets material: EPDM-P

6 FLUID DYNAMIC FEATURES

Art. 2136 12

Pre-Set		1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
Flow Rate	l/h	86	102	122	143	172	194	217	232	238	254	259
	l/s	0,024	0,028	0,034	0,040	0,048	0,054	0,060	0,064	0,066	0,071	0,072
Min Δp kPa		13	13	13,5	13,5	14	14	14	14	14,5	14,5	14,5
Kvs		0,24	0,28	0,33	0,39	0,46	0,52	0,58	0,62	0,62	0,67	0,68

Pre-Set		3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0
Flow Rate	l/h	259	266	280	281	288	294	298	300	304	314	347
	l/s	0,072	0,074	0,078	0,078	0,080	0,082	0,083	0,083	0,084	0,087	0,097
Min Δp kPa		14,5	14,5	15	15	15	15	15,5	15,5	15,5	16	16
Kvs		0,68	0,70	0,72	0,73	0,74	0,76	0,76	0,76	0,77	0,78	0,86

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Pre-Set		1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
Flow Rate	l/h	96	112	135	155	179	192	210	234	235	260	261
	l/s	0,027	0,031	0,037	0,043	0,050	0,053	0,058	0,065	0,065	0,072	0,072
Min Δp kPa		12,5	12,5	12,5	13	13	13	13	13,5	13,5	14	14
Kvs		0,27	0,32	0,38	0,43	0,50	0,53	0,58	0,64	0,64	0,69	0,70

Pre-Set		3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0
Flow Rate	l/h	261	262	271	284	318	343	409	440	456	476	483
	l/s	0,072	0,073	0,075	0,079	0,088	0,095	0,114	0,122	0,127	0,132	0,134
Min Δp kPa		14	14	15	16	17	17,5	18	18,5	19	19,5	19,5
Kvs		0,70	0,70	0,70	0,71	0,77	0,82	0,96	1,02	1,05	1,08	1,09

Art. 2136 1

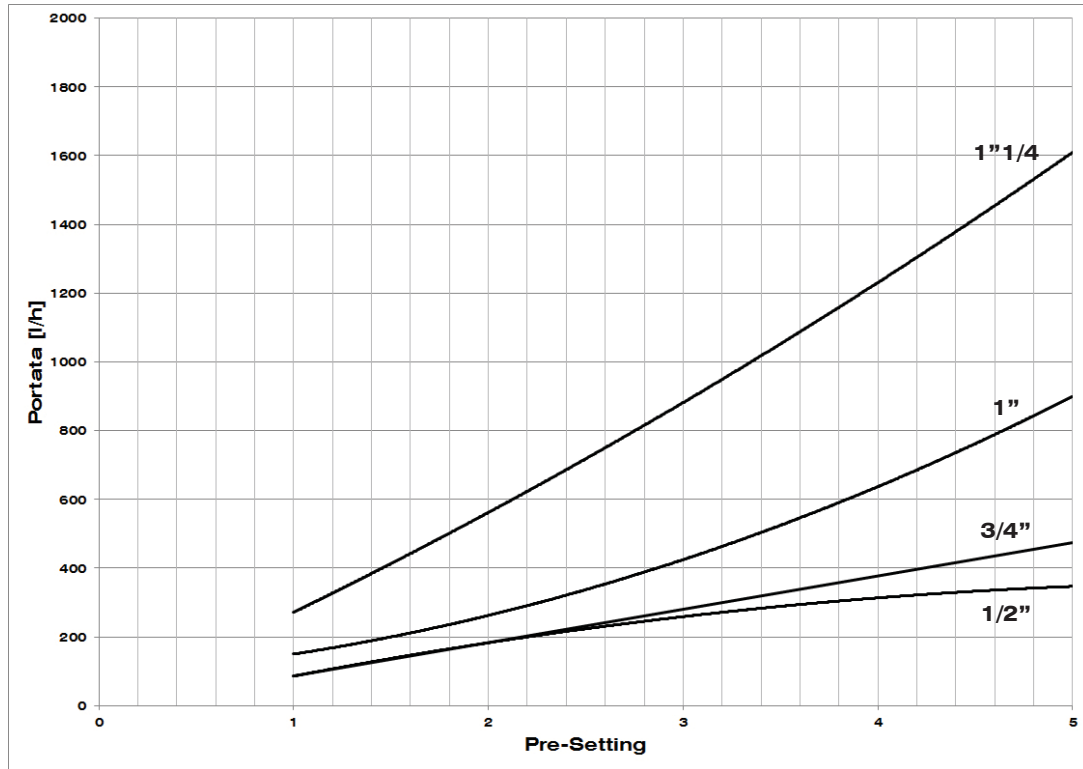
Pre-Set		1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
Flow Rate	l/h	150	200	244	259	273	315	350	370	380	390	425
	l/s	0,042	0,056	0,068	0,072	0,076	0,088	0,097	0,103	0,106	0,108	0,118
Min Δp kPa		18	18	18,5	18,5	19	19	19	19	19	19	19
Kvs		0,35	0,47	0,57	0,60	0,63	0,72	0,80	0,85	0,87	0,89	0,98

Pre-Set		3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0
Flow Rate	l/h	425	456	475	502	545	590	610	690	812	885	900
	l/s	0,118	0,127	0,132	0,139	0,151	0,164	0,169	0,192	0,226	0,246	0,250
Min Δp kPa		19	20	20	21	21	23	23	24	25	26	26
Kvs		0,98	1,02	1,06	1,10	1,19	1,23	1,27	1,41	1,62	1,74	1,77

Art. 2136 114

Pre-Set		1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
Flow Rate	l/h	272	352	400	428	490	592	645	700	740	770	882
	l/s	0,076	0,098	0,111	0,119	0,136	0,164	0,179	0,194	0,206	0,214	0,245
Min Δp kPa		18	18	19	19	20	20	2	22	23	24	25
Kvs		0,64	0,83	0,92	0,98	1,10	1,32	1,41	1,49	1,54	1,57	1,76

Pre-Set		3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0
Flow Rate	l/h	882	920	950	1046	1160	1200	1260	1345	1400	1540	1610
	l/s	0,245	0,256	0,264	0,291	0,322	0,333	0,350	0,374	0,389	0,428	0,477
Min Δp kPa		25	25	26	26	27	27	28	31	32	35	37
Kvs		1,76	1,84	1,86	2,05	2,23	2,31	2,38	2,42	2,47	2,60	2,65



Art. 2137 112

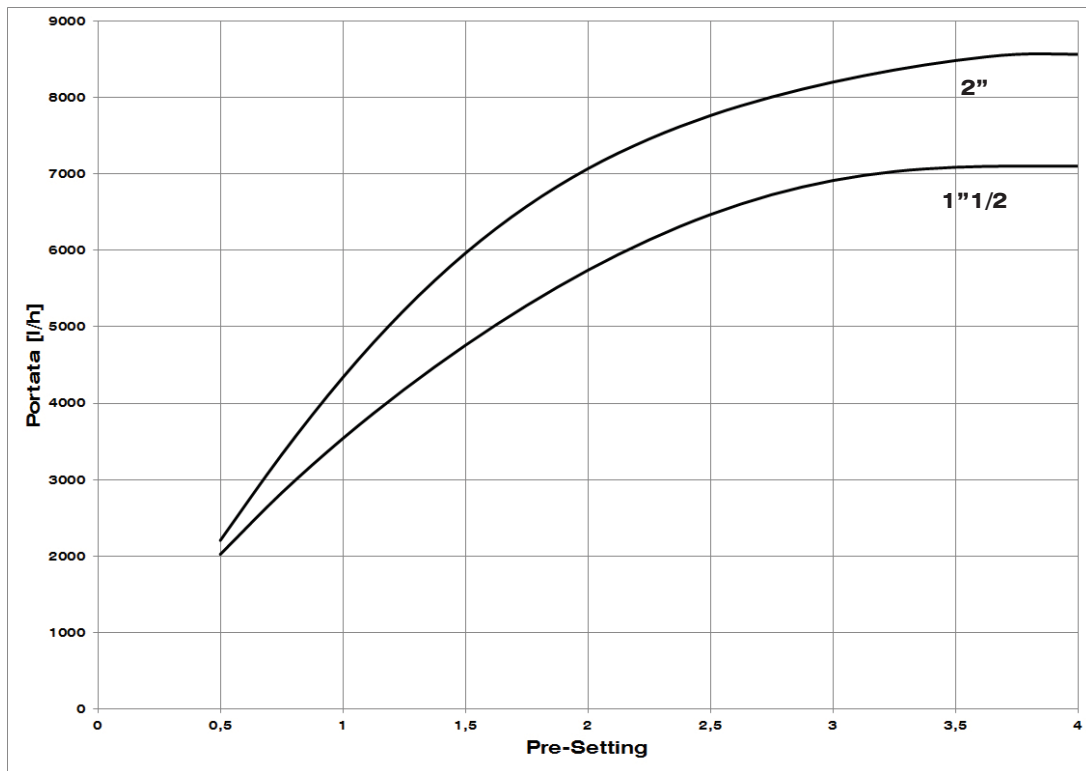
Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.0	2.25
Flow Rate	l/h	2022	2825	3538	4179	4758	5279	5741	6139
	l/s	0,562	0,785	0,983	1,161	1,322	1,466	1,595	1,705
Min Δp kPa		16	16,5	16,5	18	18	20	20	22
Kvs		5,06	6,96	8,71	9,85	11,22	11,80	12,84	13,09

Pre-Set		2.25	2.50	2.75	3.0	3.25	3.50	3.75	4.0
Flow Rate	l/h	6139	6470	6729	6916	7033	7090	7105	7105
	l/s	1,705	1,797	1,869	1,921	1,954	1,969	1,974	1,974
Min Δp kPa		22	22,5	24	25	26	26	26	26
Kvs		13,09	13,64	13,73	13,80	13,80	13,90	13,94	13,94

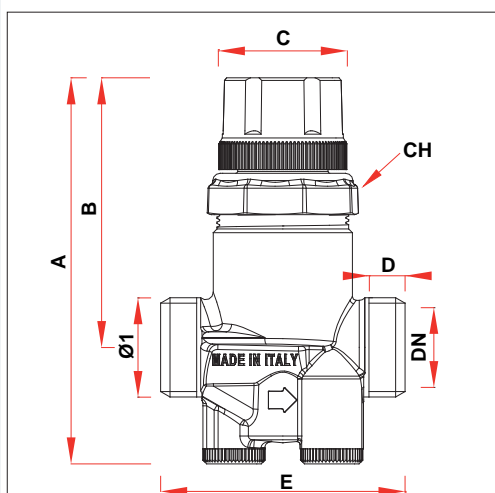
Art. 2137 2

Pre-Set		0.50	0.75	1.0	1.25	1.50	1.75	2.0	2.25
Flow Rate	l/h	2204	3325	4337	5218	5963	6577	7070	7459
	l/s	0,612	0,924	1,205	1,449	1,657	1,827	1,964	2,072
Min Δp kPa		19	22	22	25	25	28	28	29
Kvs		5,05	7,09	9,25	10,43	11,93	12,43	13,36	13,85

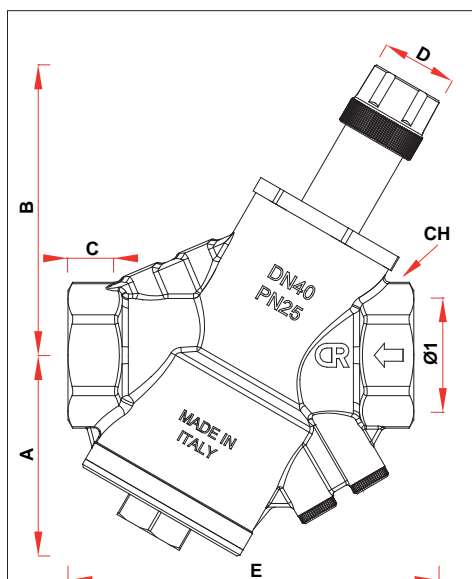
Pre-Set		2.25	2.50	2.75	3.0	3.25	3.50	3.75	4.0
Flow Rate	l/h	7459	7766	8009	8204	8362	8486	8568	8568
	l/s	2,072	2,157	2,225	2,279	2,323	2,357	2,380	2,385
Min Δp kPa		29	29	30	30	31	32	32	32
Kvs		13,85	14,42	14,62	14,98	15,00	15,00	15,15	15,18



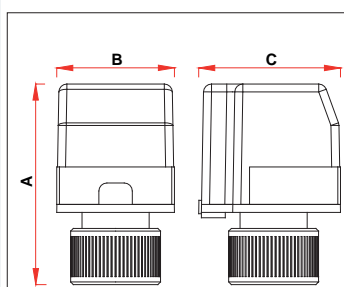
7 DIMENSIONAL FEATURES



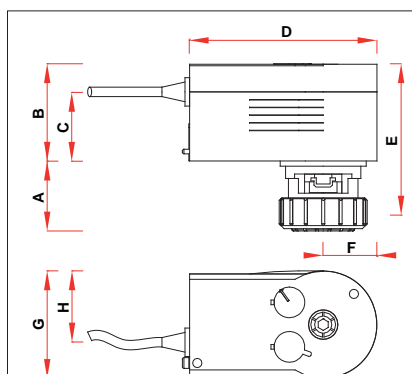
CODE	Ø1	DN	A	B	C	D	E	CH
2136 12	G1/2	10	106	75	34	9	53	39
2136 34	G3/4	15	106	75	34	11	65	39
2136 1	G1	20	129	85	34	12	82	39
2136 114	G1 1/4	25	122	83	34	13	104	39



CODE	Ø1	A	B	C	D	E	CH
2137 112	G1 1/2	84	121	17	34	144	54
2137 2	G2	89	128	20	34	155	68



CODE	A	B	C
2138 180	75	44	52



CODE	A	B	C	D	E	F	G	H
2139 150	46	63	44	122	107	35	47	70