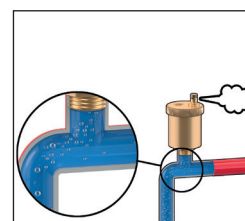
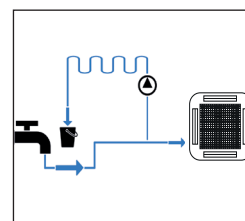
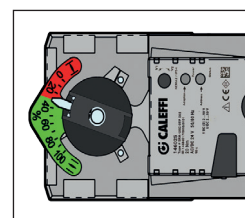
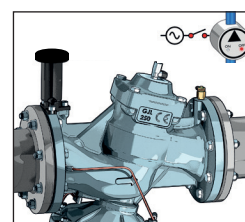
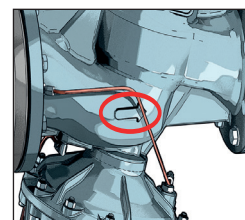
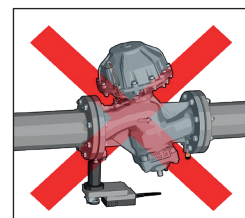


PRE-COMMISSIONING AND COMMISSIONING OF CALEFFI PICV 145 SERIES (CAST IRON) AND 146 SERIES

Pre-commissioning recommended activities and checklist

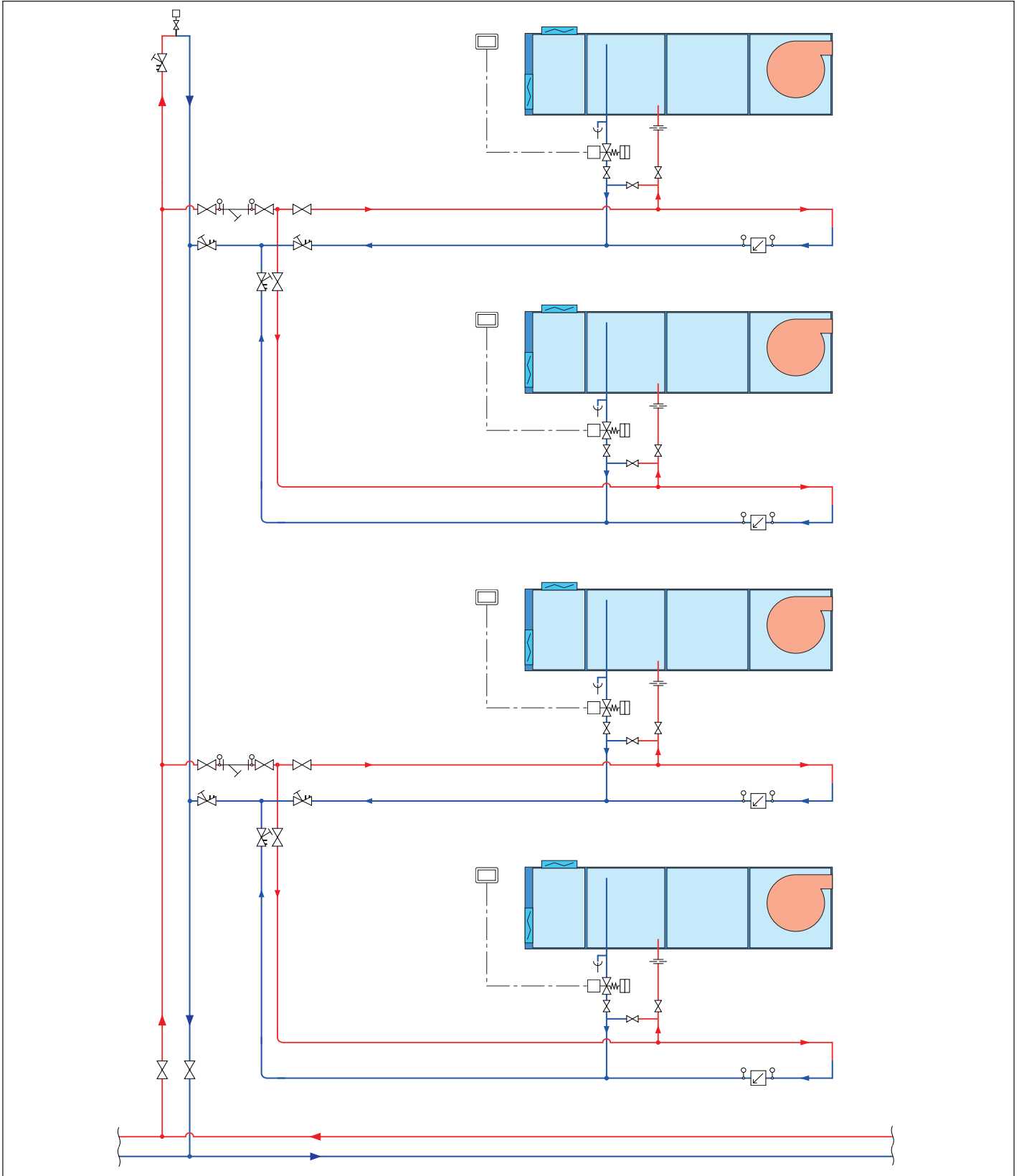
- Check the correct positioning of the valve (no upside-down if an actuator is installed).
- Check the correct flow direction of the valve.
- Do not activate the pumps if the actuator is not installed.
- Once the actuator is installed, at pumps startup, the position of the flow regulating valve must be open by at least 30% (being 0 the position for closed valve); only after pump startup regulate the position to the required flow.
- The system has to be properly flushed (better if according to BSRIA BG29/2012).
- The system must be fully filled and the air completely vented.
- Refer to Caleffi instruction sheets H0005644 (145 series), or H0000857 (146 series) for additional informations.



SCHEME

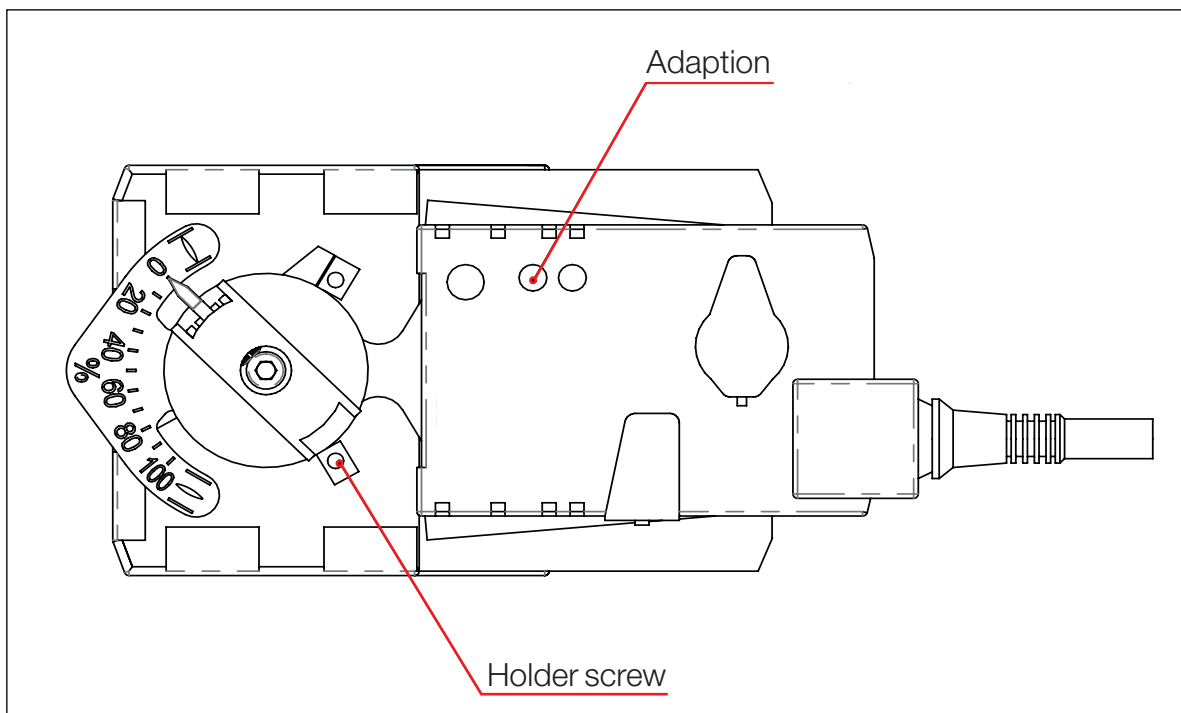
Commissioning of Caleffi 145 Series (cast iron) and 146 Series PICV according to CIBSE Commissioning Code W:2010

Pressure independent control valves (PICVs) are typically installed on branches serving terminal units. For the system shown, the regulating procedure should be as follows.



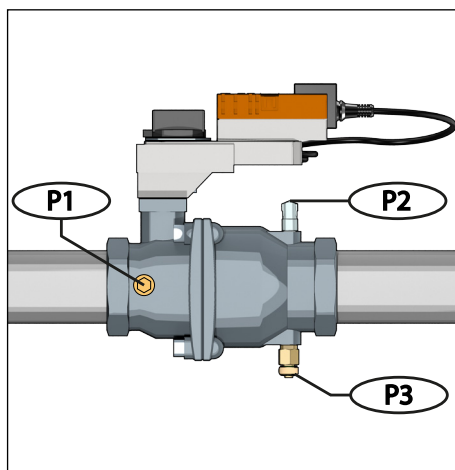
	Shut-off valve		Strainer		Drain cock		Pressure test port		PICV
	Balancing valve with flow meter		Flow meter		Flow rate regulator		Thermostat		

1. Open **all isolating valves** in the sub-branches (apart from flushing bypass valves which should remain closed).
2. For each PICV in any order, **adjust the flow to the specified design value** and record the setting.
 - 2.1 **Loosen** the holder screw.
 - 2.2 Move the holder to the **correct position** (follow the indications in Caleffi instruction sheet H0000857). Attention: the preset position is referred to the upper side of the holder.
 - 2.3 **Tighten** the holder screw in the required position.
 - 2.4 To adapt the control signal to the preset angle of rotation, **press** and hold for a few seconds the **“Adaptation” button** until the led blinks yellow. The adaption process is completed when the led blinks green.

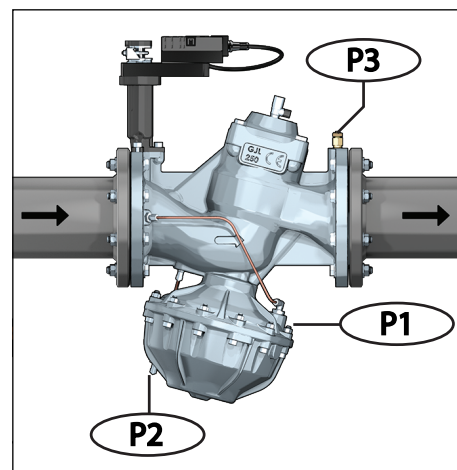


3. Using the built-in pressure ports, **measure the pressure differential across the PICV** installed in the index terminal branch. The index branch is usually either the branch furthest from the pump or the one with the highest resistance terminal unit. If in doubt, measurements should be taken in both of these locations.

145 Series (Cast Iron)



146 Series



4. Check that **the value (or values) measured is/are within the manufacturer's stated pressure differential operating range for the PICV**. If not, change the pump speed or close valves elsewhere in the system until the measured pressure differential is within the stated operating range. Refer to Flow Rate adjustment table reported in Caleffi instruction sheets (reported below).

145 Series (Cast Iron)

Caleffi code	Size	Recommended flow rate	ΔP max	Kvs		Regulator position								
						20%	30%	40%	50%	60%	70%	80%	90%	100%
						2	3	4	5	6	7	8	9	10
145895	DN 40	2,9 - 9,3 m ³ /h	600 kPa	25,2	Q [m ³ /h]	2,4	2,9	3,8	4,8	6,0	7,1	8,0	8,7	9,3
					ΔP min [kPa]	20	20	20	20	30	30	30	30	30
145905	DN 50	5,1 - 14,8 m ³ /h	600 kPa	33,6	Q [m ³ /h]	3,5	5,1	7,1	8,7	10,4	11,9	13	13,8	14,8
					ΔP min [kPa]	30	30	30	30	30	30	30	30	30

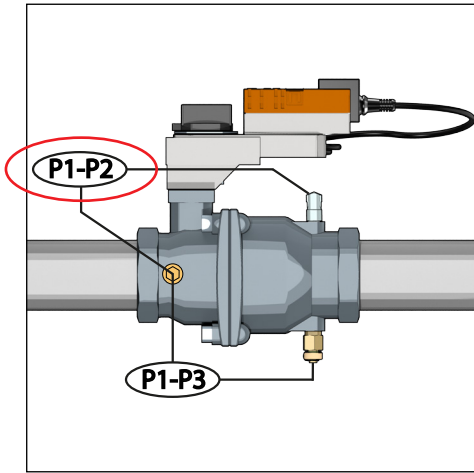
146 Series

Caleffi code	Size	Recommended flow rate	ΔP max	Kvs		Regulator position									
						15%	20%	30%	40%	50%	60%	70%	80%	90%	100%
						1,5	2	3	4	5	6	7	8	9	10
146060	DN 65	6,2 - 26 m ³ /h	400 kPa	66,3	Q [m ³ /h]	4,4	6,2	8,6	11,6	14,9	17,4	20,2	22,3	24	26
					ΔP min [kPa]	30	30	30	30	30	30	50	50	50	50
146080	DN 80	7,6 - 36 m ³ /h	400 kPa	96,6	Q [m ³ /h]	4,7	7,6	11,4	15,2	19	23	26,6	30,4	32,7	36
					ΔP min [kPa]	30	30	30	30	30	30	30	50	50	50
146100	DN 100	15,8 - 82,5 m ³ /h	400 kPa	278	Q [m ³ /h]	11,4	15,8	23,2	30,7	38,2	47,9	58,3	68,3	75,2	82,5
					ΔP min [kPa]	30	30	30	30	30	30	50	50	70	70
146120	DN 125	20 - 125 m ³ /h	400 kPa	332	Q [m ³ /h]	13,1	19,9	31,7	43,3	55	70,6	83,3	100	112,5	125
					ΔP min [kPa]	30	30	30	30	30	50	50	60	70	70
146150	DN 150	27 - 160 m ³ /h	400 kPa	427	Q [m ³ /h]	19	26,8	44,7	63,9	78,6	94,2	113,3	132,1	148,9	160
					ΔP min [kPa]	30	30	30	30	30	30	50	60	70	70

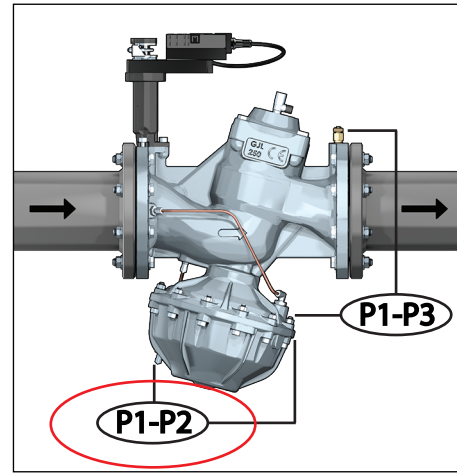
5. For a direct metering of the Flow Rate, using the built-in pressure ports, **measure the pressure differential (P1-P2) across every single PICV** to confirm that the set design Flow Rate for each terminal is being achieved within the required tolerance limits.

5.1 Meter **differential pressure** (P1-P2).

145 Series (Cast Iron)



146 Series



5.2 Use the following table to retrieve **Kv₁₋₂** value.

145 Series (Cast Iron)

Opening position (%)	Kv ₁₋₂ (m ³ /h)	
	145895	145905
	DN 40	DN 50
20	5,2	7,5
30	7,2	11,1
40	9,2	15,1
50	12,6	19,5
60	15,3	23,5
70	18,7	27,1
80	21,4	29,8
90	24,6	31,4
100	25,2	33,6

146 Series

Opening position (%)	Kv ₁₋₂ (m ³ /h)				
	146060	146080	146100	146120	146150
	DN 65	DN 80	DN 100	DN 125	DN 150
15	9,7	10,7	26,4	26,5	38,1
20	13,7	17,3	37,4	41,1	55,
30	19,2	26,6	57,9	67,3	96,7
40	25,9	36,7	79,3	94,5	142,6
50	34,7	45,9	102,4	127,1	189,2
60	42,6	57,8	136,1	166	231,3
70	48,8	68,6	171,8	203,8	275,1
80	54,7	78,8	215,6	259,6	335,6
90	61,2	89,2	244,1	300,2	386,7
100	66,3	96,6	278	332,1	427,5

5.3 Use the following formula to do the **Flow Rate calculation**.

$$G = Kv_{1-2} \times \sqrt{\Delta p_{1-2}} \times 0,1$$

G [m³/h]
Δp [kPa]

