Selection of Modulating Feedwater Valves Pneumatically Actuated

Safety

Your attention is drawn to
Safety Information Leaflet IM-GCM-10

1. Selection of the valve body size

The standard valve for modulating boiler water level control is DN40 (1½") nominal pipe size (40 mm). A range of seat sizes to suit this body is available to suit most sizes of boilers. However, for smaller or larger boilers, alternative sized valves can be selected from the Spirax Sarco range - See overleaf.
Valve stem seals are available in normal (PTFE) or high temperature (graphite) material. We recommend the use of the high temperature seal to decrease the possibility of leakage over long term use. Valves with high temperature stem seals are suffixed 'H'.

2. Selection of the valve body material and pressure rating

The valve body must be suitable for the maximum pressure and temperature in the feedwater line.
Standard valve types are as follows:

SG iron body	**KE71**	Screwed	PN25 rating (Pmax 25 bar g at 120°C)
	KE73	Flanged	
Cast steel body	**KE43**	Flanged	PN40 rating (Pmax 40 bar g at 120°C)

3. Selection of the valve K_V

The DN40 valve body size is available with various seat sizes giving a choice of K_V values.
Use the graph to select a suitable K_V as follows:

a) The feedwater flowrate is the actual maximum steam generation rate of the boiler plus any blowdown rate where this is significant. In practice the use of the 'from and at' boiler rating will give a small safety margin. In the example this is 15 000 kg/h.
b) The pressure drop across the valve is the feedpump pressure at the maximum flowrate, minus the boiler pressure, minus any valve and pipework losses. In the example the available pressure drop is 1.5 bar.
c) Select the larger K_V value, 16 in this example. If right on the line, or if in doubt, select a larger K_V.

4. Selection of the actuator + valve adaptor

The actuator has to be capable of shutting off against the maximum feedpump pressure to Class IV when the boiler is not under pressure.
Select the actuator + valve adaptor from the table below:

Actuator type		**PN9123E**		**PN9223E**	
Valve size	**Kv value**	**Maximum feedpump pressure bar g**			
DN40	**25.0**	11.0	(8)	40	(40)
	16.0	11.0	(8)	40	(40)
	10.0	11.0	(8)	40	(40)
	6.3	11.0	(8)	40	(40)

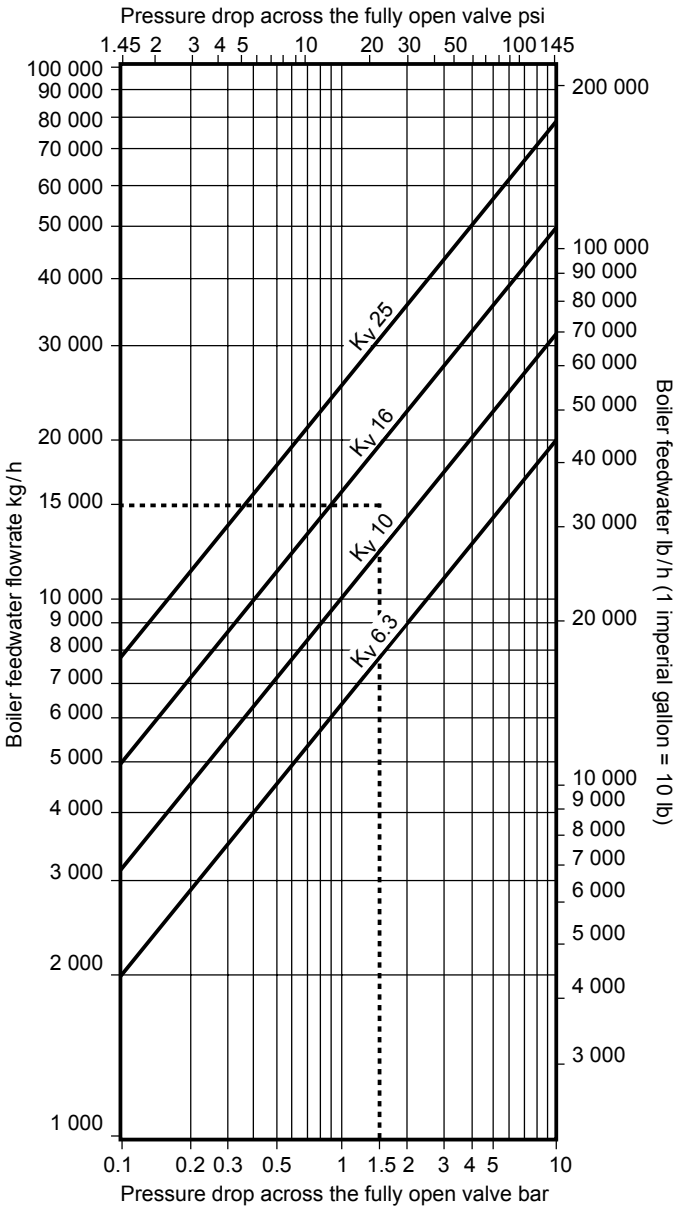
Figures in brackets denotes the differential pressures for valves fitted with high temperature graphite stem sealing. These valves have a suffix 'H'.

Valve stroke is 20 mm.

5. Electropneumatic positioner

Specify EP5 positioner (4 - 20 mA input).

Valve K_V selection graph



For alternative sizes to the standard DN40 (1½")

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Standard valve types are as follows:

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	KE73	Flanged	
Cast steel body	**KE43**	Flanged	PN40 rating (Pmax 40 bar g at 120ºC)

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c) Select the larger K_V value, 16 in this example. If right on the line, or if in doubt, select a larger K_V.

4. Selection of the actuator + valve adaptor

The actuator has to be capable of shutting off against the maximum feedpump pressure to Class IV when the boiler is not under pressure.

Select the actuator + valve adaptor from the table below:

Actuator type		**PN9123E**		**PN9223E**	
Valve size	**Kv value**	**Maximum feedpump pressure bar g**			
DN50	**36.0**	7	(5)	38	(36)
	25.0	7	(5)	38	(36)
	16.0	7	(5)	38	(36)
	10.0	7	(5)	38	(36)
DN32	**16.0**	29	(23)	40	(40)
	10.0	29	(23)	40	(40)
	6.3	29	(23)	40	(40)
	4.0	29	(23)	40	(40)
DN25	**10.0**	37	(29)	40	(40)
	6.3	37	(29)	40	(40)
	4.0	37	(29)	40	(40)
	1.6	37	(29)	40	(40)
DN20	**6.3**	40	(40)	-	-
	4.0	40	(40)	-	-
	1.6	40	(40)	-	-
	1.0	40	(40)	-	-
DN15	**4.0**	40	(40)	-	-
	1.6	40	(40)	-	-
	1.0	40	(40)	-	-

Figures in brackets denotes the differential pressures for valves fitted with high temperature graphite stem sealing. These valves have a suffix 'H'.

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Valve K_V selection graph