Cert. No. LRQ 0963008

ISO 9001

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. For very small or very large boilers, however, smaller or larger 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:-

KE71	SG iron body, screwed end connections, PN25 rating (Pmax 25 bar g at 120°C).
KE73	SG iron body, flanged end connections, PN25 rating (Pmax 25 bar g at 120°C).
KE43	Cast steel body, flanged end connections, 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 Kv values. Use the graph to select a suitable Kv 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 next larger Kv value, 16 in this example. If right on the line, or if in doubt, select a larger Kv.

4. Selection of the actuator and 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 and valve adaptor from the Table below:-

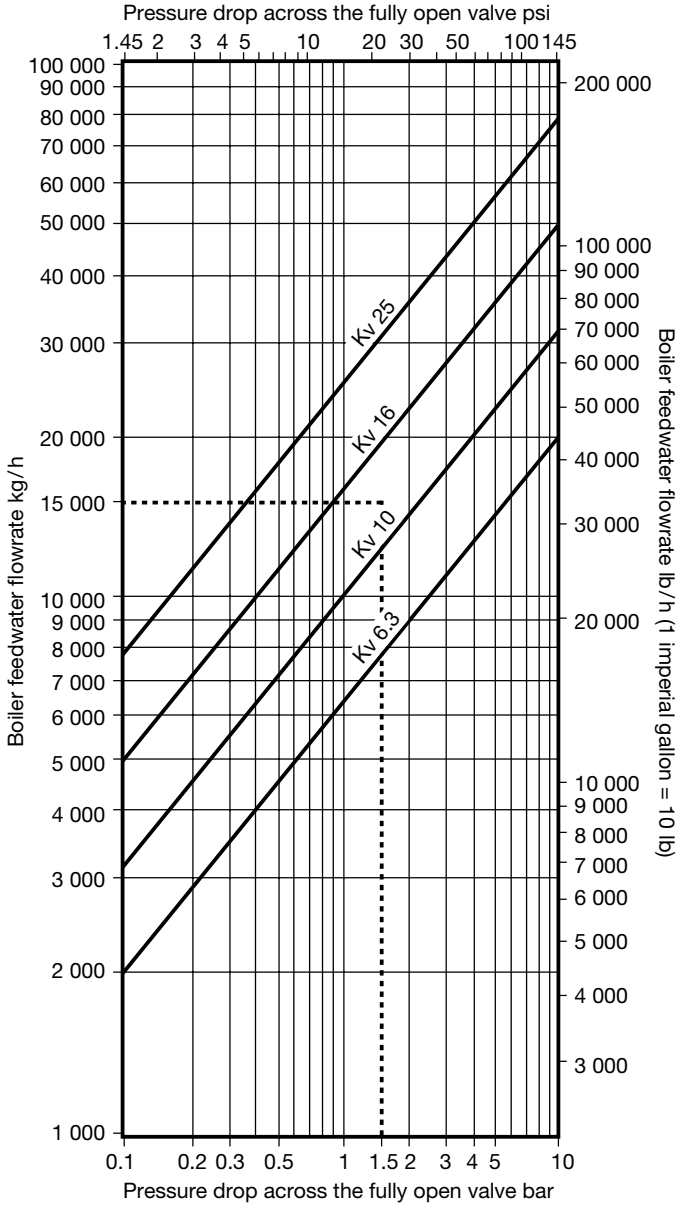
Actuator type		**PN9123E**		**PN9223E**	
Valve size	**Kv value**	**Maximum feedpump pressure bar g**			
DN40	**25.0**	11.0	(8)	40	(40)
	16.0	11.0	(8)	40	(40)
	10.0	11.0	(8)	40	(40)
	6.3	11.0	(8)	40	(40)

Figures in brackets denote 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 line sizes other than DN40 (1½")

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:-

KE71	SG iron body, screwed end connections, PN25 rating (Pmax 25 bar g at 120°C).
KE73	SG iron body, flanged end connections, PN25 rating (Pmax 25 bar g at 120°C).
KE43	Cast steel body, flanged end connections, PN40 rating (Pmax 40 bar g at 120°C).

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'.

3. Selection of the valve K_V

Use the graph to select a suitable Kv 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 next larger Kv value, 16 in this example. If right on the line, or if in doubt, select a larger Kv.

4. Selection of the actuator and 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 and 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 denote 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