spirax /sarco

Selection of
Modulating Feedwater Valves
Electrically 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 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.
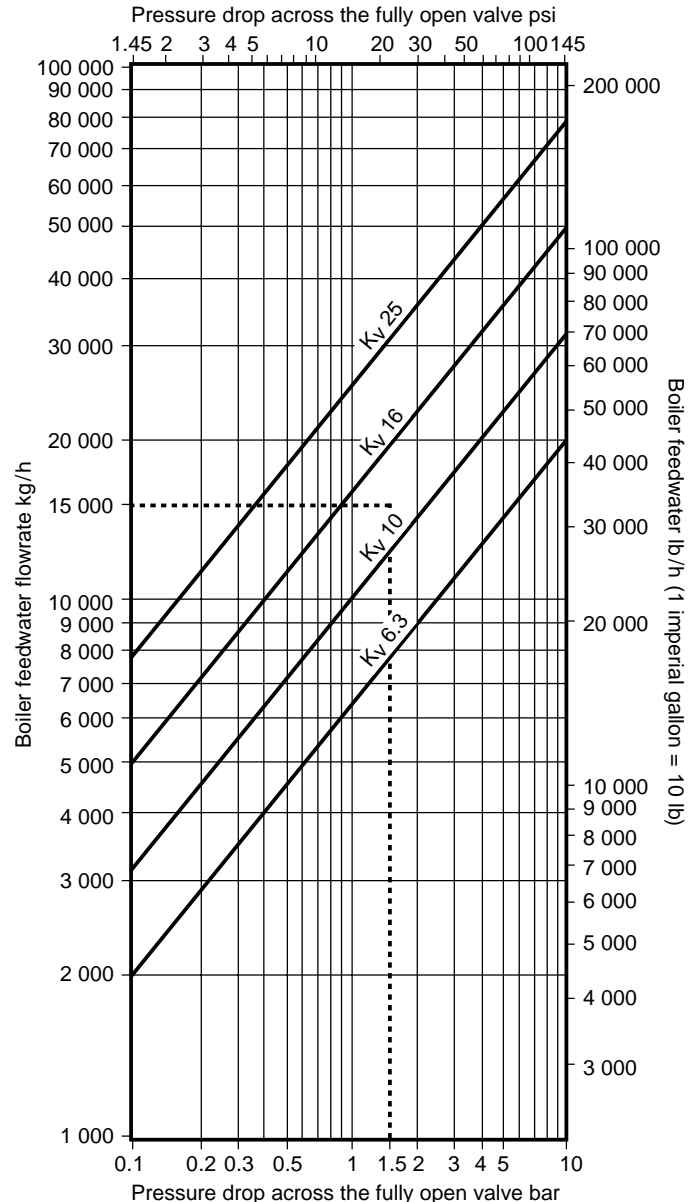
4. Selection of the actuator and valve adaptor
The actuator has to be capable of shutting off against the maximum feedpump pressure when the boiler is not under pressure. Select the actuator and valve adaptor from the table below:-

Actuator type		EL5611	EL5621	EL5631
	220 / 240 V	EL5611	EL5621	EL5631
	110 V	EL5612	EL5622	EL5632
	24 V	EL5613	EL5623	EL5633
Valve size	**K_V value**	**Maximum feedpump pressure bar g**		
DN40	**25.0**	12.0 (8.5)	28.5 (25)	40.0 (40)
DN40	**16.0**	19.8 (14.3)	40.0 (40)	- -
DN40	**10.0**	38.3 (27.7)	40.0 (40)	- -
DN40	**6.3**	40.0 (40.0)	- -	- -
Valve adaptor		EL5911	EL5921	EL5931
Mounting flange		EL5970	EL5970	EL5970

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. Actuator speed is 0.5 mm/s

Valve K_V selection graph

Pressure drop across the fully open valve psi

Boiler feedwater flowrate kg/h

Boiler feedwater lb/h (1 imperial gallon = 10 lb)

Pressure drop across the fully open valve bar

5. Potentiometer
Specify 1 000 Ω feedback potentiometer type EL5952.

For other sizes other than DN40 (1½")

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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 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 and valve adaptor

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Actuator type	220 / 240 V	EL5611	EL5621	EL5631
	110 V	EL5612	EL5622	EL5632
	24 V	EL5613	EL5623	EL5633
Valve size	**Kv value**	**Maximum feedpump pressure bar g**		
DN50	36.0	6.7 (4.7)	16.3 (14.3)	29.7 (27.2)
	25.0	12.0 (8.5)	28.5 (25.0)	40.0 (40.0)
	16.0	19.8 (14.3)	40.0 (40.0)	- -
	10.0	38.3 (27.7)	40.0 (40.0)	- -
DN32	16.0	19.8 (14.3)	40.0 (40.0)	- -
	10.0	38.3 (27.7)	40.0 (40.0)	- -
	6.3	40.0 (40.0)	- -	- -
	4.0	40.0 (40.0)	- -	- -
DN25	10.0	38.3 (27.7)	40.0 (40.0)	- -
	6.3	40.0 (40.0)	- -	- -
	4.0	40.0 (40.0)	- -	- -
	1.6	- -	- -	- -
DN20	6.3	40.0 (40.0)	- -	- -
	4.0	40.0 (40.0)	- -	- -
	1.6	40.0 (40.0)	- -	- -
	1.0	40.0 (40.0)	- -	- -
DN15	4.0	40.0 (40.0)	- -	- -
	1.6	40.0 (40.0)	- -	- -
	1.0	40.0 (40.0)	- -	- -
Valve adaptor		EL5911	EL5921	EL5931
Mounting flange		EL5970	EL5970	EL5970

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. Actuator speed is 0.5 mm/s

5. Potentiometer

Specify 1 000 Ω feedback potentiometer type EL5952.

Valve K_V selection graph

Pressure drop across the fully open valve psi

Boiler feedwater flowrate kg/h

Boiler feedwater lb/h (1 imperial gallon = 10 lb)

Pressure drop across the fully open valve bar