

Rotary-Shoe and Paddle Types

Application



Danfoss Randall H Series Motorised Valves, working in conjunction with time controls and thermostats, are used in domestic and commercial central heating, hot water and chilled water systems to control the flow of water in the system.

They are designed and built for long term operation under arduous conditions of high temperatures and rapid pressure fluctuations.

These valves, based on traditional designs but improved by on-going product development, are second to none in terms of robustness, dependability and operating efficiency. Higher-than-usual test pressures, support bearings at both top and bottom of the shoe and paddle spindles and tough polycarbonate actuator covers are some of the features which ensure this, and yet there is no price premium for the added quality.

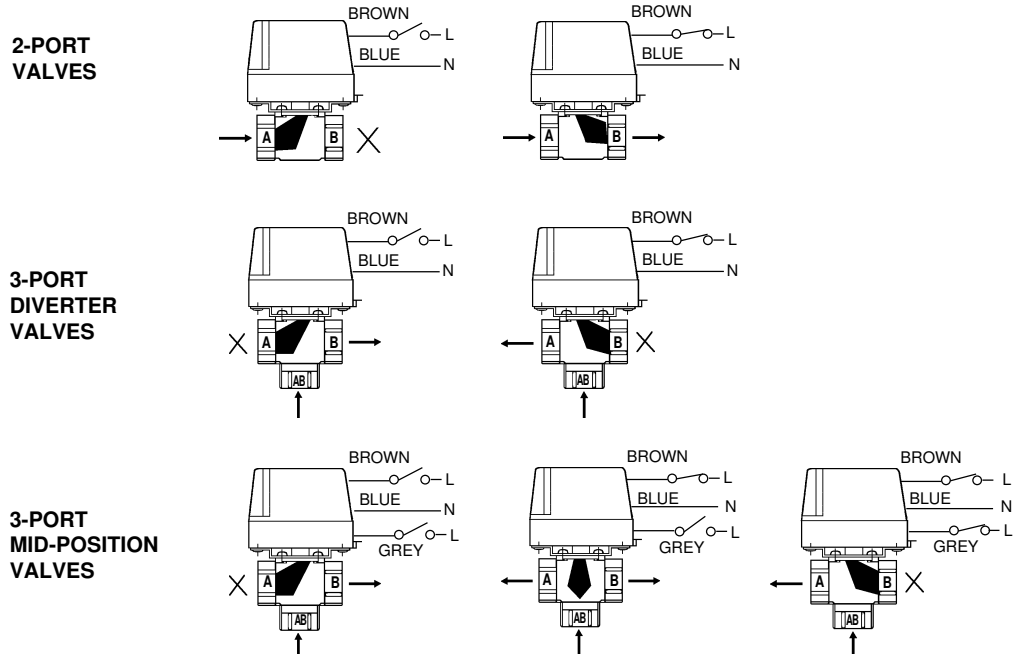
H Series valves are normally purchased as separate valve bodies and actuators, but are available as sets for some of the more popular combinations, see Product Selection Guide for details. Actuators are fitted to the valve bodies on site for convenience of installation and

serviceability.

Available as either rotary-shoe or paddle types, H Series valves offer the specifier and installer whatever he decides is appropriate for the job. The range caters for virtually all needs, ie. 2-port, 3-port diverter or mid-position, metric sizes 15mm, 22mm and 28mm with copper compression fittings and imperial sizes 1/2", 3/4" and 1" BSP threaded.

- Total choice of valves to suit every installation and preference
- Suitable for heating and cooling applications
- Proven reliability
- Long working life
- Actuators and valve bodies supplied separately for convenience
- Easy installation and wiring
- Industry-standard fittings and wiring colours
- Robust construction
- Low cost

Valve / Actuator Configuration



## Data Sheet

## H Series Motorised Valves

### Ordering Codes

Order Code	Size	Description	Kv (m3/hr)	Max. Diff Pressure (Bar)	Max. Work. Pressure (Bar)	Max. Operating Temp (°C)
<b>PADDLE VALVES - 2 PORT</b>						
HPV15B	15mm	Internal compression	3.0	1.0	10.0	95
HPV22B	22mm	External compression	5.8	1.0		
HPV28B	28mm	External compression	7.9	0.7		
HPV0.5B	1/2"	BSP	3.0	1.0		
HPV0.75B	3/4"	BSP	5.8	1.0		
HPV1.0B	1"	BSP	7.9	0.7		
<b>PADDLE VALVES - 3 PORT</b>						
HSV3B15	15mm	Internal compression	3.0	1.0	10.0	95
HSV3B22	22mm	External compression	6.1	1.0		
HSV3B28	28mm	External compression	7.9	0.7		
HSV3B0.5	1/2"	BSP	3.0	1.0		
HSV3B0.75	3/4"	BSP	6.1	1.0		
HSV3B1.0	1"	BSP	7.9	0.7		
<b>SHOE VALVES - 2 PORT</b>						
HPV15	15mm	Internal compression	3.3	1.0	10	95
HPV22	22mm	External compression	8.2	1.0		
HPV28	28mm	Internal compression	15.0	0.7		
HPV0.5	1/2"	BSP	3.3	1.0		
HPV0.75	3/4"	BSP	8.2	1.0		
HPV1.0	1"	BSP	15.0	0.7		
<b>SHOE VALVE - 3 PORT</b>						
HSV3	22mm	External compression	6.8	1.0	10.0	95

NOTE: All valve bodies can be used in chilled water applications using 60/40% Glycol/Water mix.

### Actuator Ordering Codes

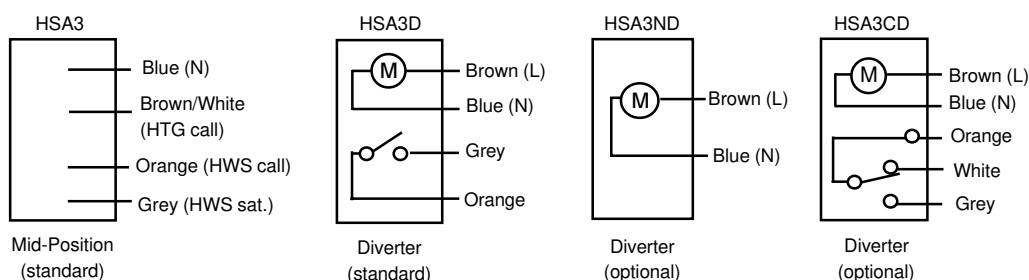
Order Code	Description	Aux. Sw. Details	Valve Body Compatibility		
			HPV... 2 Port	HSV... 3 Port as Diverter	HSV... 3 Port as Mid-Positio
HPA2N	2 port, N.C. spring return actuator	None	•		
HPA2	2 port, N.C. spring return actuator	SPST	•		
HPA2C	2 port, N.C. spring return actuator	SPDT	•		
HSA3ND	3 port, diverter valve actuator	None		•	
HSA3D	3 port, diverter valve actuator	SPST		•	
HSA3CD	3 port, diverter valve actuator	SPDT		•	
HSA3	3 port, mid-position valve actuator	SPST (int. linked)			•

### Specifications

VALVE BODY SPECIFICATIONS	
Body and Trims	Hot stamped or die cast brass
Top Seal Gasket	THK-Ethylene propylene
Spindle O Ring Seals	Fluorobon Fluoro-elastomer
Paddle Material (Paddle type)	Nitrile elastomer
Shoe Material (Shoe type)	Carbon filled PTFE
VALVE ACTUATOR SPECIFICATIONS	
Voltage Rating *	220/240Vac, 50/60Hz
Maximum Power Consumption	6 watts
Maximum Ambient Temperature	45°C
Opening Time	< 35 seconds
Closing Time	< 20 seconds
Auxiliary Switch Rating (if fitted)	3 (1) A, 220/240Vac, 50/60Hz
Enclosure Rating	IP40

\* 24V and 110V versions available on special order.

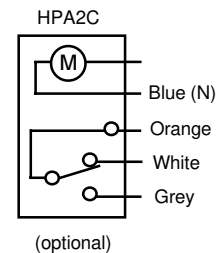
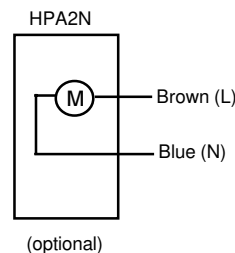
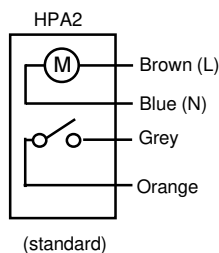
### Actuator Wiring Detail (Three-Port)



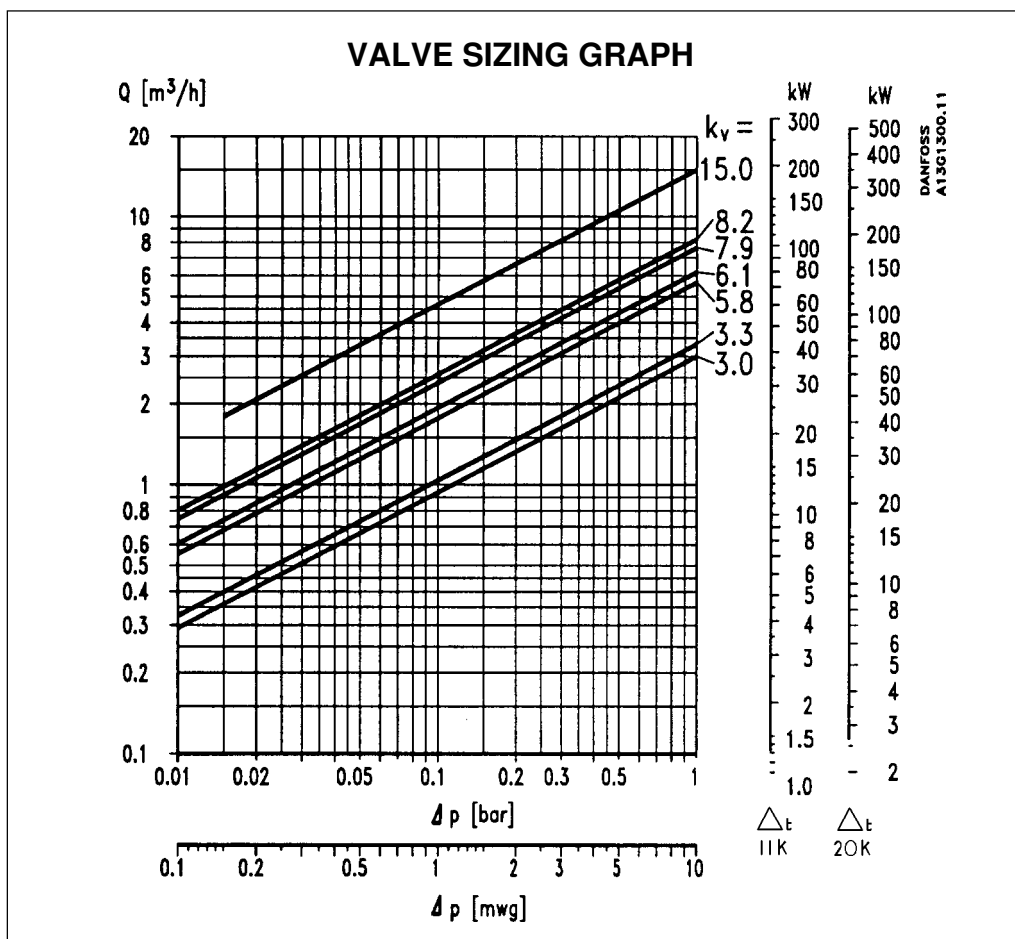
## Data Sheet

## H Series Motorised Valves

### Actuator Wiring Detail (Two-Port)



### Sizing



The pressure drop across an H Series valve can be determined from the Kv diagram above.

The chart, which shows the Kv values of all H Series valves as diagonal lines, can be used to determine pressure drop when the flow rate is known (m<sup>3</sup>/h). It can also be used to read off pressure drop values when the heating load (kW) is known.

A vertical axis, scaled in kW for systems working at temperature differences of either 11°C or 20°C, is included in the chart.

Alternatively, pressure drop values can be calculated using the formula:-

$$\Delta P = \left( \frac{Q}{K_v} \right)^2$$

Where:-  
**Q** = Flow rate (m<sup>3</sup>/h)  
**Kv** = Co-efficient of Flow (m<sup>3</sup>/h)  
**ΔP** = Pressure Drop across the valve (bar)

Kv values of each valve type and size are shown in the table opposite.

#### Examples of chart use:

1) To determine the pressure drop across a 22mm. 3-port paddle valve (Kv = 6.1), at a flow rate of 2.0 m<sup>3</sup>/h, follow the horizontal line from the 2.0 m<sup>3</sup>/h point on the left-hand vertical axis until it crosses the diagonal 6.1 Kv line.

By following a vertical line downwards from this point, a pressure drop of 0.11 bar can be read off the horizontal axis at the base of the chart.

2) To determine the pressure drop across a 22mm. 2-port paddle valve (Kv = 5.8), for a 20 kW heating load in a system working at an 11°C temperature difference, follow the horizontal line from the 20 kW point on the appropriate right-hand vertical axis until it crosses the diagonal 5.8 Kv line.

By following a vertical line downwards from this point, a pressure drop of 0.072 bar can be read off the horizontal axis at the base of the chart.

Dimensions

