General Information
Control Valves and Strainers

Product Categories

6.1 Control Valves

General Information - Medium-Controlled Control Valves
6.1 Control Valves

The medium-controlled Hawle control valve is a hydraulically operated diaphragm valve consisting of a main valve, a pilot circuit, a pilot valve, and accessories. The function of the control valve (pressure reduction, pressure maintenance, level regulation, ...) is determined via the control line and the pilot valve. The dimension of the main valve depends on the pressure conditions and the flow rates.

The Hawle control valve can be used for various applications. There is a broad range of both standard and special functions available.

Types:

Operating mode: hydraulic

Pressure retention valve / safety valve (Ord. No.: 014-00, 014-01, 014-03, 014-04, 014-06

Float valve for open/close control, Ord. No.: 016-00, 016-01

Standard functions, purely hydraulic:

- Pressure reduction
- Pressure retention and/or pressure relief
- Float control
- Level control
- Backflow prevention
- Pipe-break protection

Operating mode: hydraulic + control current

Open/close valve, Ord. No.: 017-03 closed at zero current, 017-04 opened at zero current

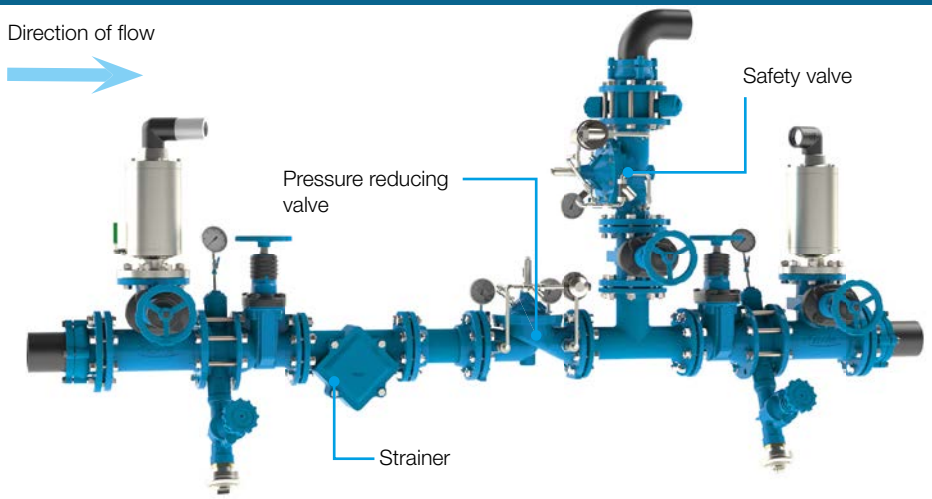
Volume regulation valve, Ord. No.: 017-95/017-96/017-97

Standard functions, hydraulic and control current:

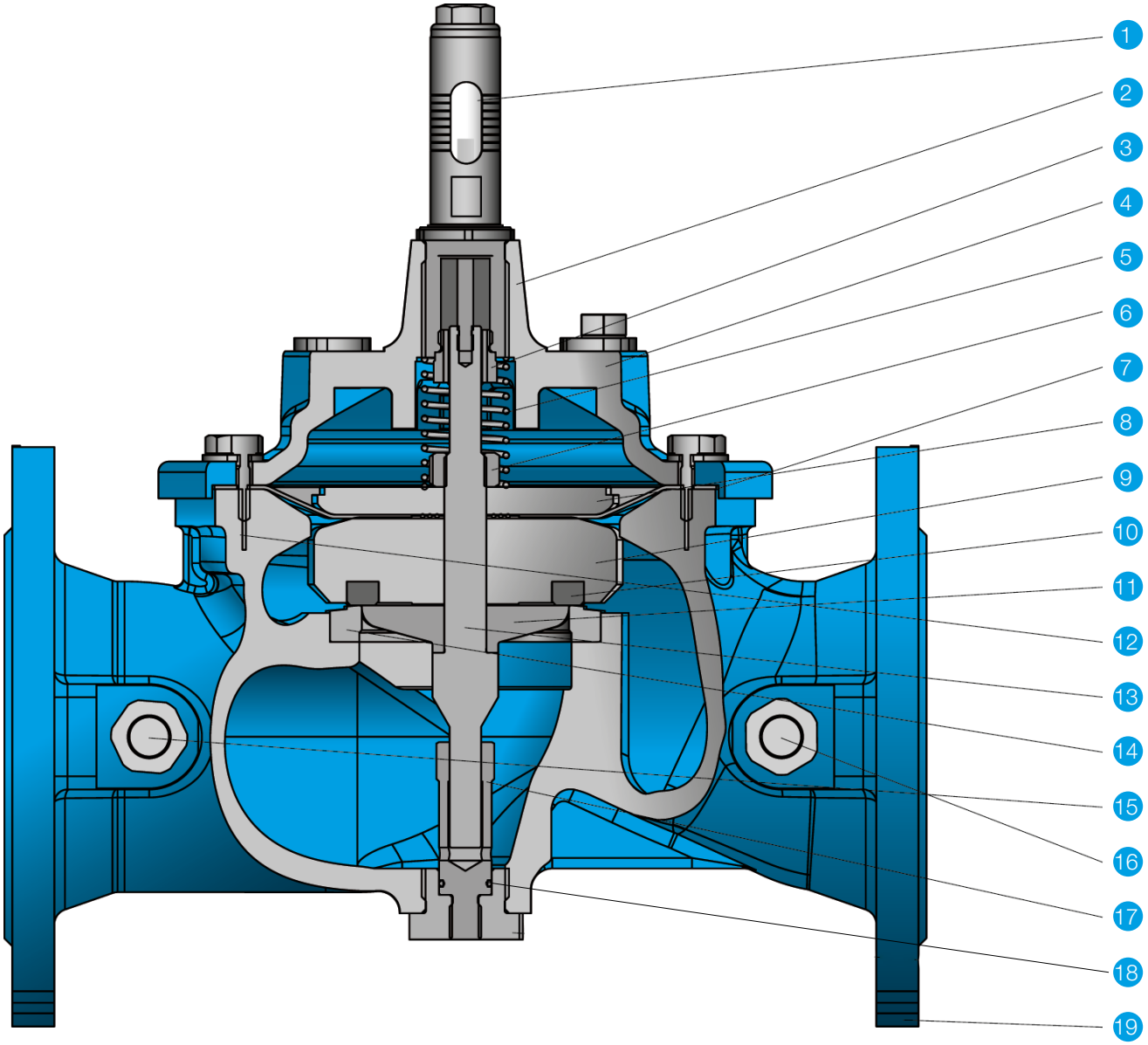
- Electric open/close function
- Electric volume control
- Pump protection valves

Special functions, e.g.: pressure reduction with inlet pressure control, pressure retention valve for electric actuation

Installation situation:



Valve design:

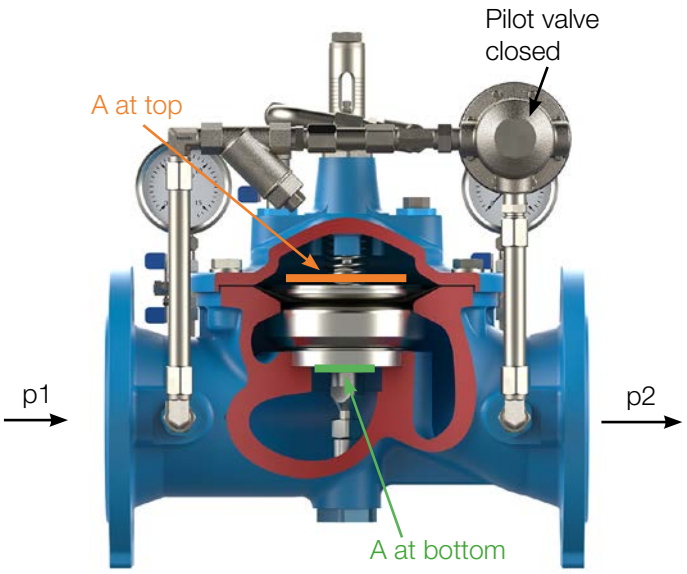


Components

1. Optical position indicator
2. Cover
3. Spindle guide, cover
4. Connection control line, cover
5. Spring
6. Nut
7. Diaphragm
8. Thrust washer
9. Gasket carrier
10. Seat seal
11. Opposing seat
12. Hexagon head screw
13. Spindle
14. Seat
15. Connection control line, body (inlet)
16. Connection control line, body (outlet)
17. Spindle guide, body
18. O-ring
19. Body

Functional priciple:

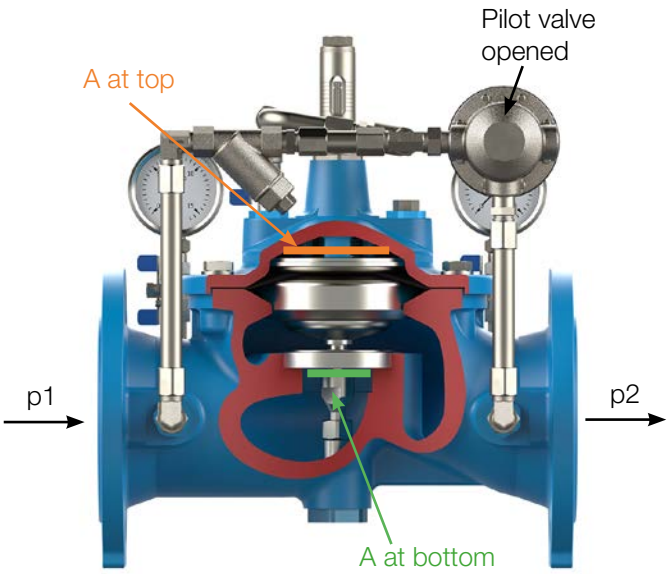
Medium-controlled control valves do not need any external energy for functioning. The desired function is accomplished purely hydraulically. Only a few control valve types will require control current to trigger the hydraulic operation.



Pilot valve closed:
p1 x A at top (= closing force) > p1 x A at bottom (= opening force)

Inlet pressure p1 acts on the diaphragm surface A at top thus generating the closing force.

Main valve closed



Pilot valve opened:
p1 x A at top (= closing force) < p1 x A at bottom (= opening force)

When the pilot valve is opened, pressure is released from the pilot chamber to p2. Inlet pressure p2 acts on A at bottom thus opening the main valve.

Main vlave opened

Functional requirement:

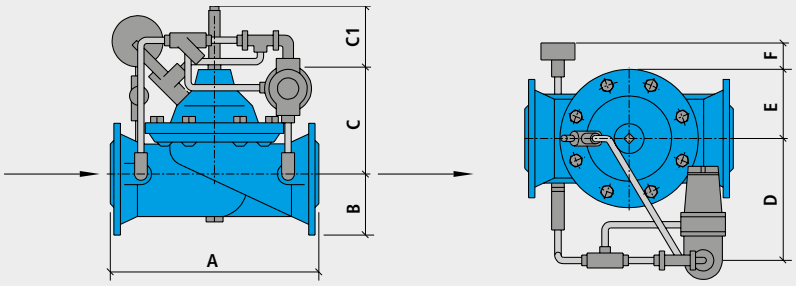
- A at top > A at bottom
- Minimum inlet pressure p: 1 bar
- Minimum pressure difference between inlet and outlet pressure: 1 bar
- Potable water and/or service water with the degree of purity of potable water

Caption:

A at top	= diaphragm surface in the pilot chamber
A at bottom	= surface in the lower seat area
p1	= inlet pressure
p2	= outlet pressure

Warranty of functional reliability:
- Annual function testing
- Major maintenance every 4 to 5 years including exchange of wear parts

Straight valve - measurement tables



Face-to-face dimensions acc. to DIN EN 558

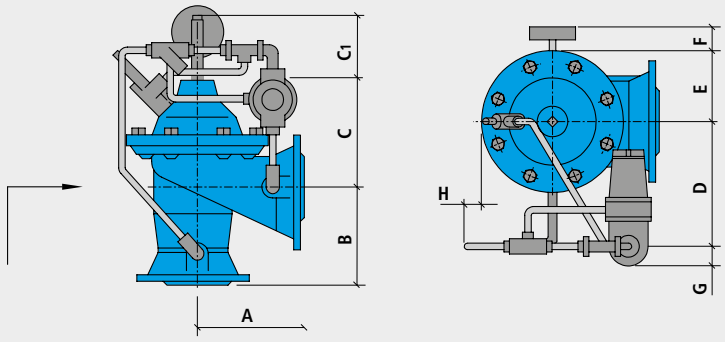
Flange mating dimensions acc. to DIN EN 1092-2

	PN [bar]	[1] 1 1/2" - 2" [mm]	DN 40 [mm]	DN 50 [mm]	DN 65 [mm]	DN 80 [mm]	DN 100 [mm]	DN 125 [mm]	DN 150 [mm]	DN 200 [mm]	DN 250 [mm]	DN 300 [mm]
A	10/16/25	210	200	230	290	310	350	400	480	600	730	850
B	10/16	40	75	80	90	100	110	125	140	170	200	235
	25	40	75	80	90	100	115	135	150	180	-	-
C		130	130	130	150	160	195	245	278	330	405	365
D		160	160	160	170	180	190	205	220	250	275	740
E		65	70	70	85	105	115	145	160	200	250	740
F [2]		-	80	80	65	65	65	45	40	20	-	-
Valve with optical position indicator												
C1		85	85	85	85	85	85	112	112	112	112	135
Valve with electric position indicator												
C1		138	138	138	138	138	138	164	164	164	180	180

1) with threaded outlet

2) reference value depending on valve type

Control valves, angle valves, measurement tables



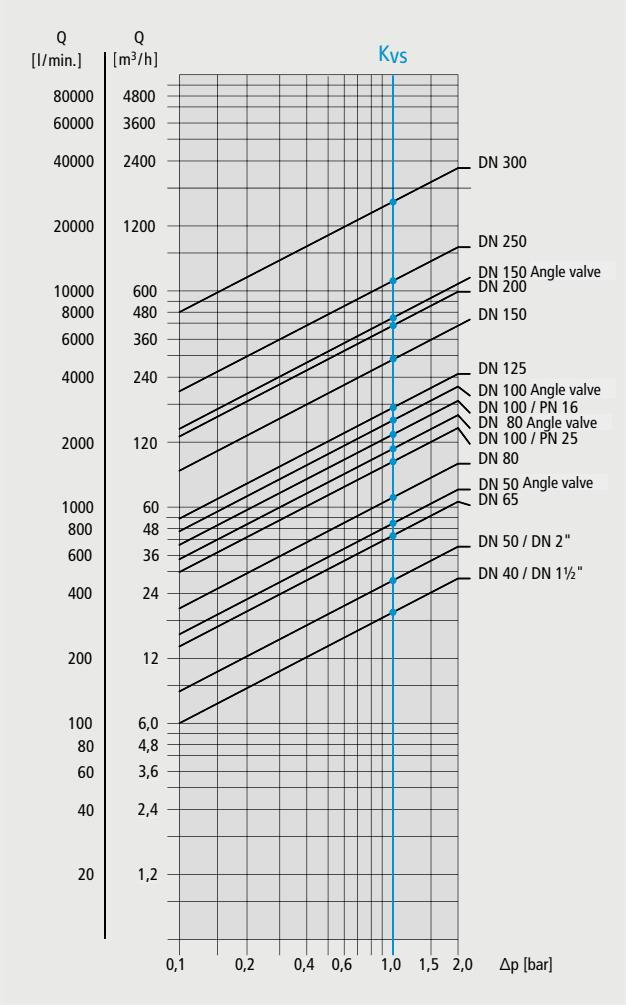
Face-to-face dimensions acc. to DIN EN 558

Flange mating dimensions acc. to DIN EN 1092-2

	DN 50 [mm]	DN 80 [mm]	DN 100 [mm]	DN 150 [mm]
A	125	155	190	250
B	125	155	175	225
C	145	195	225	320
D	170	160	220	250
E	85	115	145	200
F	56	70	55	55
G	40	40	40	40
H	30	-	-	-
Valve with optical position indicator				
C1	80	80	80	135
Valve with electric position indicator				
C1	138	138	138	180

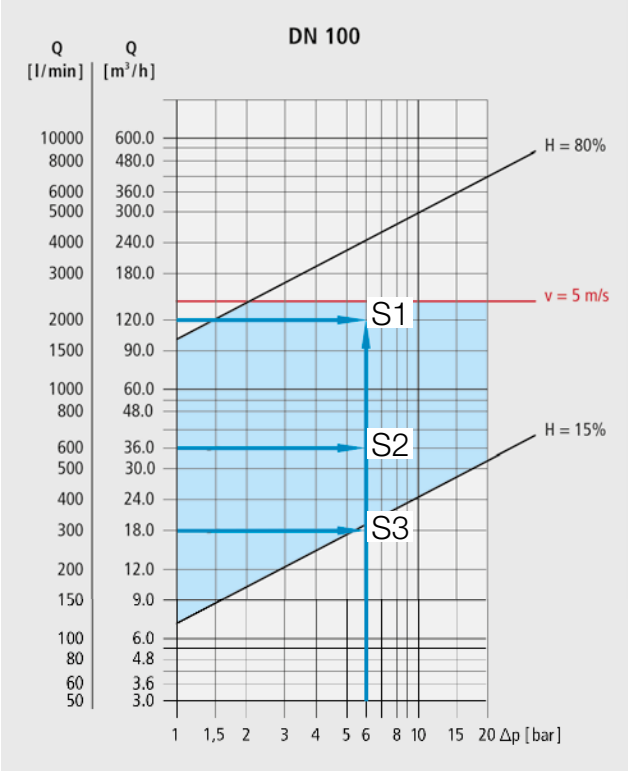
Pressure drop diagram and Kvs values

Pressure drop Δp as a function of flow rate Q and the nominal width DN of the valve



Flow coefficient Kvs in m3/h and l/min at Δp = 1 bar					
DN	Kvs straight valve		DN	Kvs angle valve	
	m3/h	l/min.		m3/h	l/min.
40	19	315			
50	27	460	50	51	850
65	48	725			
80	68	1140	80	111	1850
100	129	2150	100	156	2600
125	177	2955			
150	297	4960	150	432	7200
200	415	6925			
250	681	11360			
300	1476	24600			

Determination of the dimension of the main valve (example)



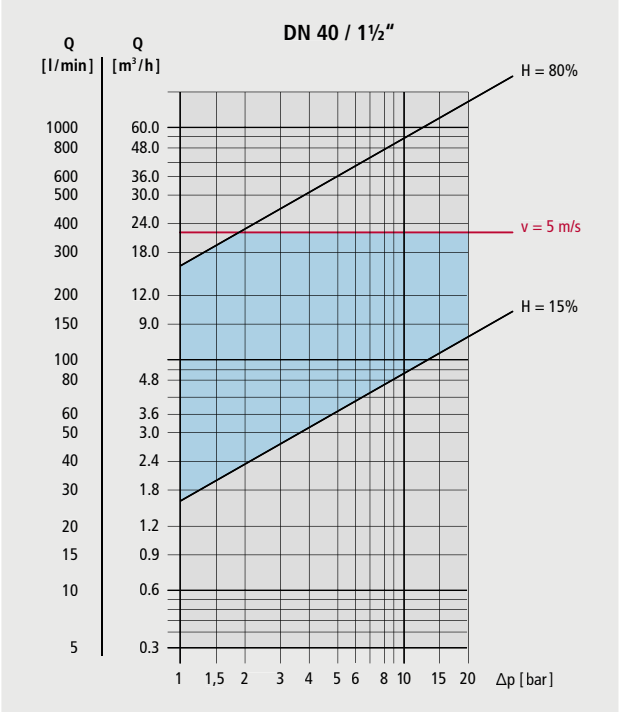
Parameters
Q = flow rate in m3/h and l/min
Δp = pressure difference between inlet and outlet pressure in bar
H = degree of opening in % of max. valve opening
v = 5 m/s: max. admissible flow rate
■ = optimum control range

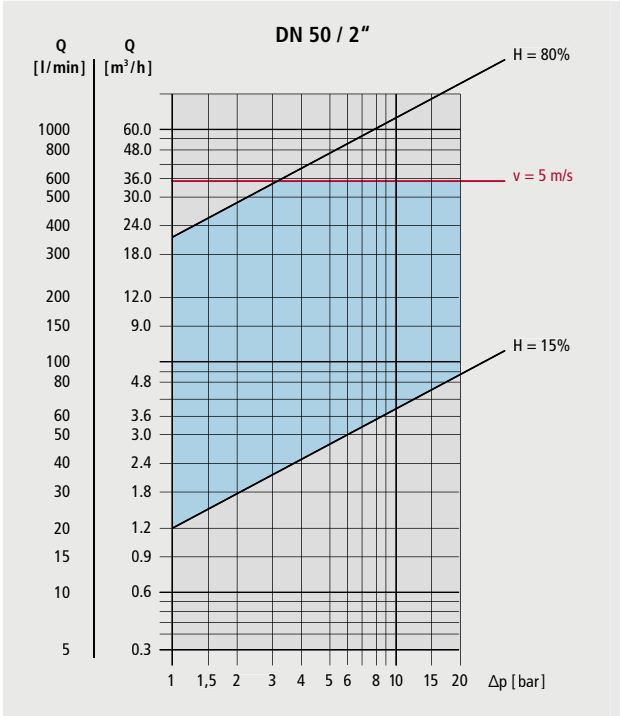
Example:
Δp: 6 bar
Q max: 120 m3/h > point of intersection S1 within optimum control range
Q Ø: 36 m3/h > point of intersection S2 within optimum control range
Q min: 18 m3/h > point of intersection S3 at the threshold to the optimum control range
Result: main valve DN 100 = optimum dimension

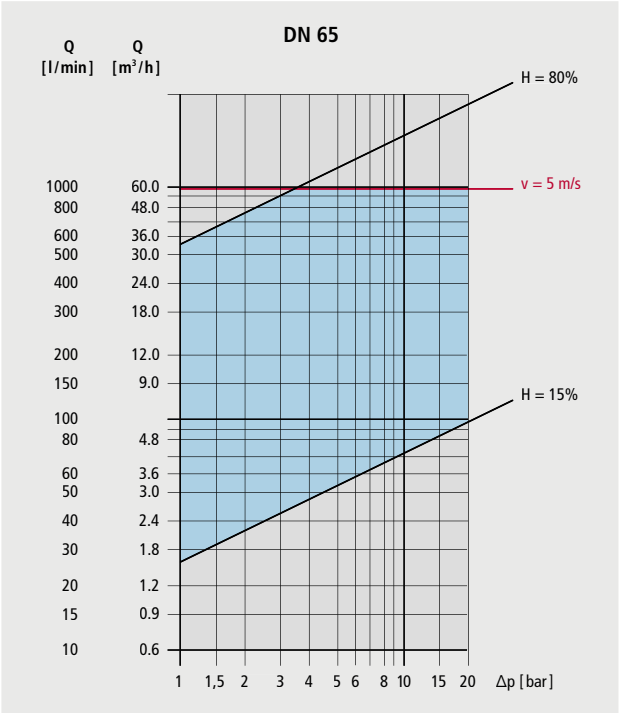
Generally, we recommend dimensioning to be performed by Hawle Armaturen GmbH.

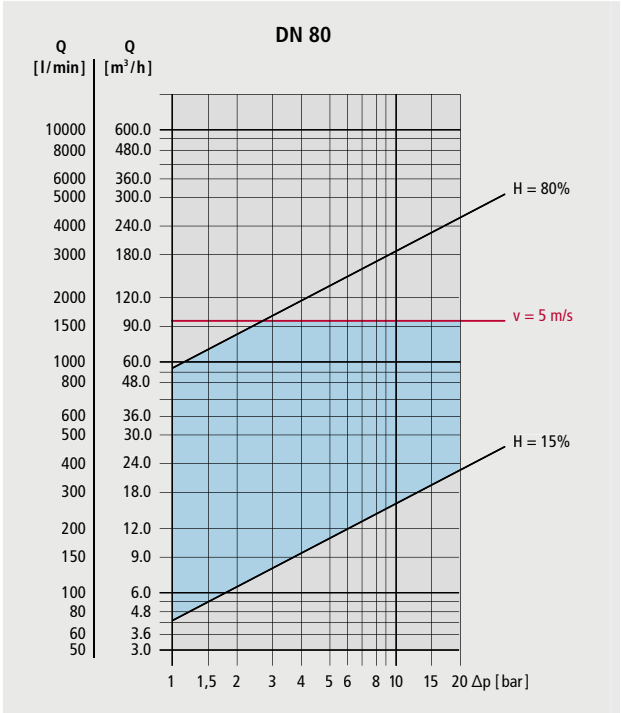
Performance charts for straight valves DN 40 - DN 80 for year of manufacture 03/2008 and later

The area between the limits of the degree of opening H = 15% and H = 80% is the optimum operating range (coloured area) of the Hawle control valves. If the established value is below the minimum or above the maximum value, please contact us.



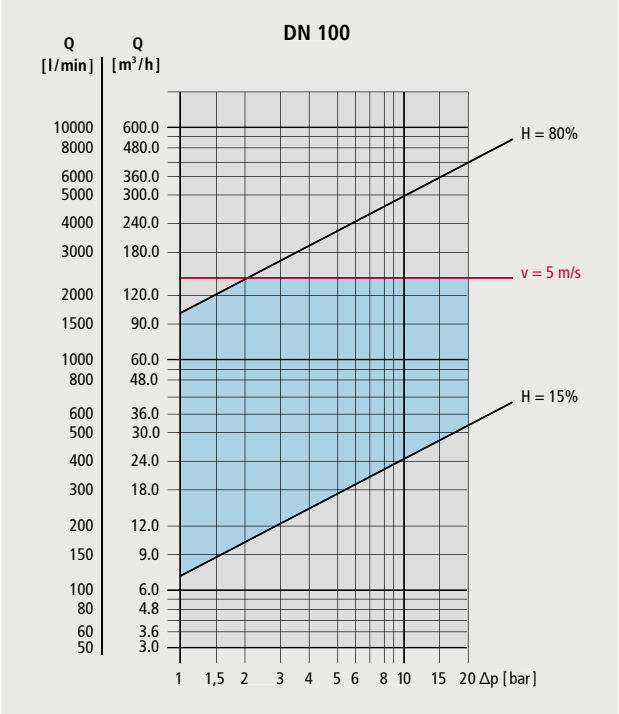


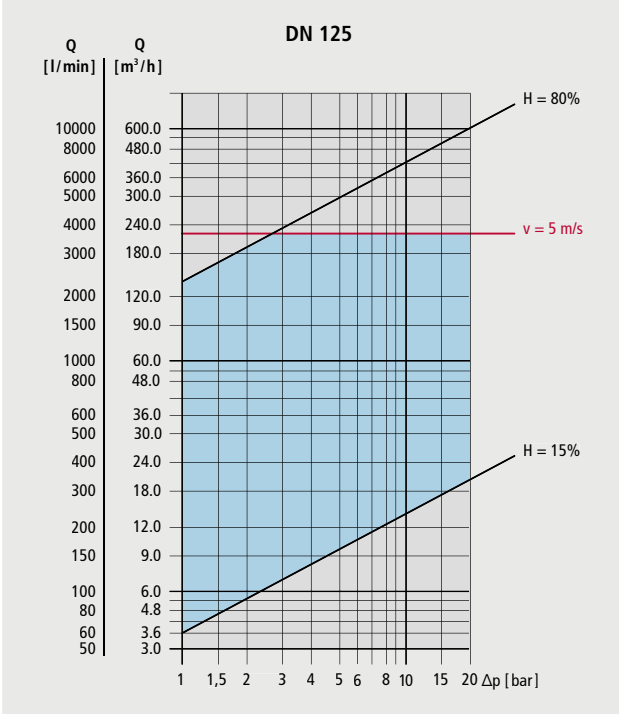


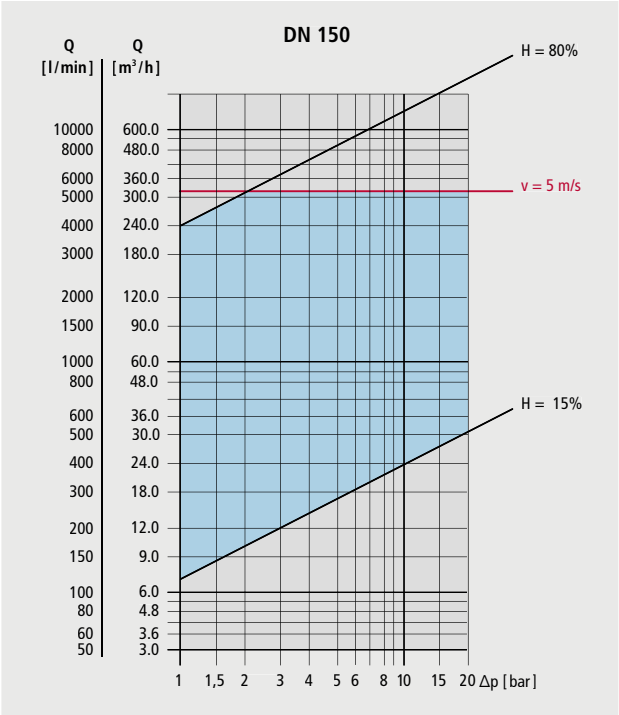


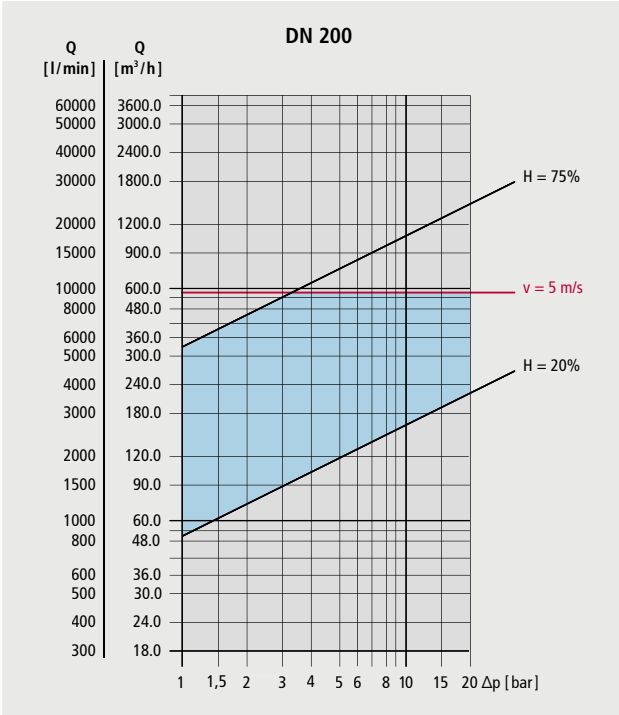
Performance charts for straight valves DN 100 - DN 200 for year of manufacture 03/2008 and later

The area between the limits of the degree of opening H = 15% and H = 80% is the optimum operating range (coloured area) of the Hawle control valves. If the established value is below the minimum or above the maximum value, please contact us.









Performance charts for straight valves DN 250 - DN 400 for year of manufacture 03/2008 and later

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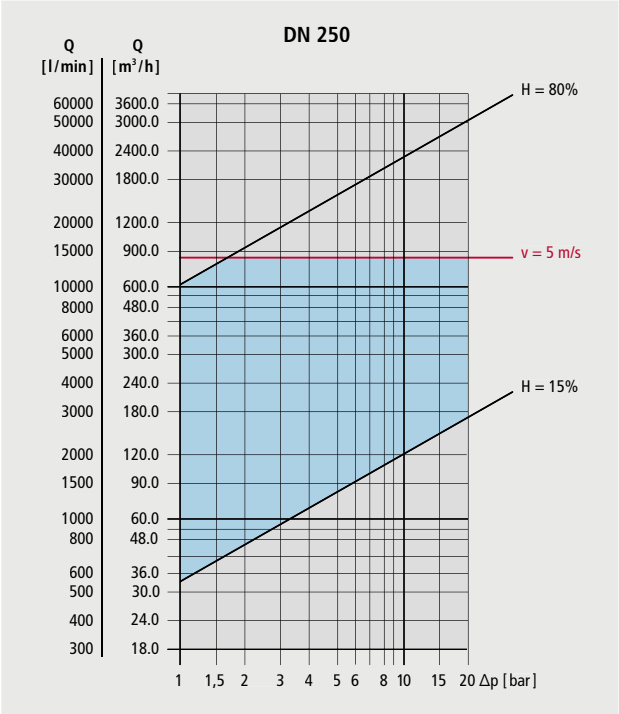

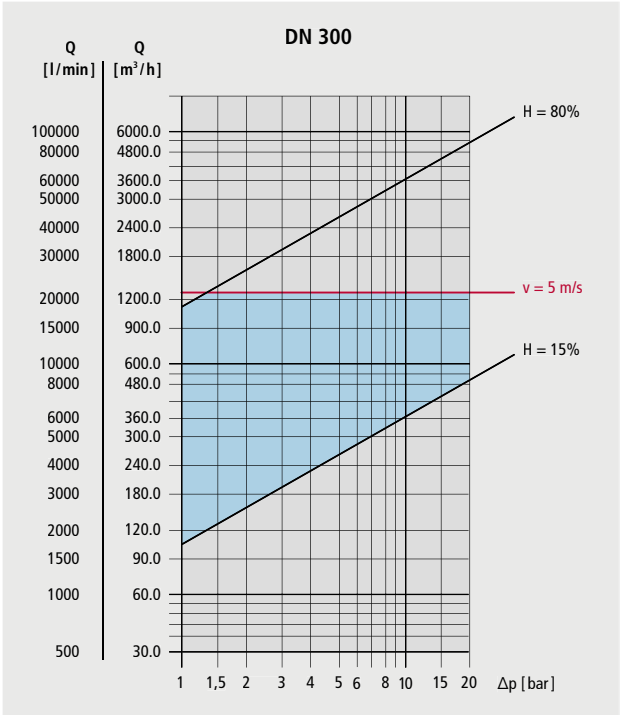

Performance charts for angle valves DN 50, DN 80, DN 100, DN 150 for year of manufacture 03/2008 and later

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