MANNESMANN REXROTH

Power Limiting Valve LV 06 (Constant Horsepower Control) Control Element for Series 5*

RA 95 546/01.93

Replaces: 1.82

Power limiting valve LV 06 consists of a direct operated relief valve and a stepped spool (1), which is loaded on both sides by the pilot control spring (2) and the regulator spring set (3), and which is hydraulically operated by the main system pressure.

In hydrostatic drives, it is often required to alter the output flow of the pump in such a manner that the pre-determined input drive torque is not exceeded, even with varying working pressures. This means that, at a constant drive speed, the input power must be limited.

Ordering code

LV	06	1	A	5

Description
Power limiting valve **= LV**

Size
Size **= 06**

Model [1]
Threaded connections **= 1**
O-ring connections **= 2**
O-ring and threaded connections **= 3**

Type of connection
O = without subplate
A = with subplate

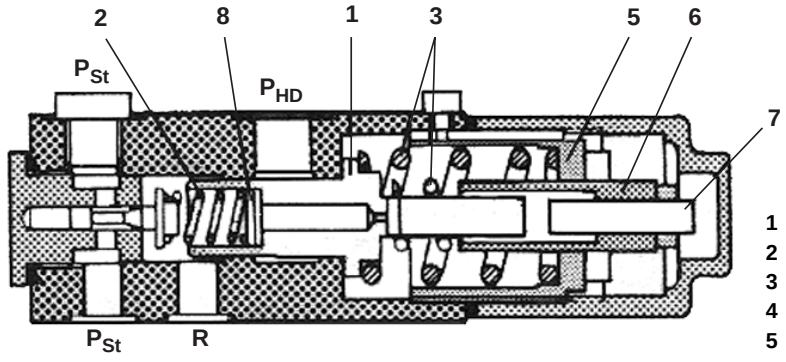
Series[2]
5 = Series 5

Ordering example
LV 06.1.A.5
Power limiting valve
size 6 with threaded connections and subplate, for series 5

[1] For model variations see unit dimensions
[2] When mounting separately, the LV 06 is independent of the pump model

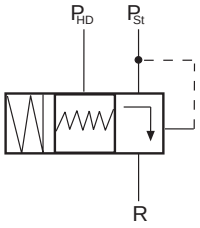
Design details

LV 06, Series 5



The setting of the pilot spring (2) is achieved by means of screw (4) or by shims (8). The two parts of the regulating spring set (3) are set completely independent of each other by the threaded cap (5) and the hollow screw (6). The end stop is set by screw (7).

Symbol



1 stepped spool
2 pilot spring
3 regulating spring set
4 screw
5 threaded cap
6 hollow screw
7 screw
8 shims

Connections
p_{HD} operating pressure
p_{St} pilot pressure
R return line

Technical data (partly to VDI 3276)

Design: direct operated, seated type pressure relief valve

Mounting:
flange model with O-ring seals or threaded connections

Pipe connections and connection sizes:
see unit dimensions

Weight lbs (kg)		Series 5
without subplate	10 (4.5)	5 (2.3)
with subplate	14.3 (6.5)	8.8 (4.0)

Mounting position: optional

Direction of flow: from P_{St} to R

Operating pressure range
High pressure side: p_{HD} = 0 ... 5800 PSI (0 ... 400 bar)
Pilot pressure side: p_{St} = 0 ... 870 PSI (0 ... 60 bar)

Pressure setting range (pilot pressure side)
p_{St} = 145 ... 406 or 145 ... 652 PSI (10 ... 28 or 10 ... 45 bar)
(alternative settings on request)

The pressure setting range must be stated in clear text when ordering.

Fluid temperature range
$\delta_{m\,min}$ ... $\delta_{m\,max}$ = – 4 ... 176 °F (– 20 ... + 80 °C)

Viscosity range

ν_{min} ...ν_{max} = 45 ... 4640 SUS (10 ... 1000 mm²/s)

Nominal flow Q_N = 1.3 GPM (5 L/min)

Co-ordination with control devices

Direct mounting

Direct mounting on the HD control (series 5) (note point 5 in ordering code).

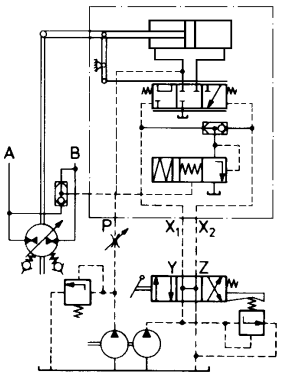
Note that control type S 3041 is changed when LV 06 is fitted S 3141.

Separate mounting

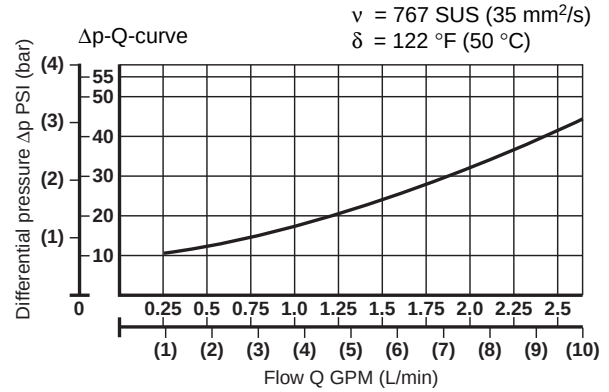
Power limiting valve LV 06 can be fitted in the pilot circuit of axial piston units with pressure dependent control devices independent of the build series, if it is installed separately.

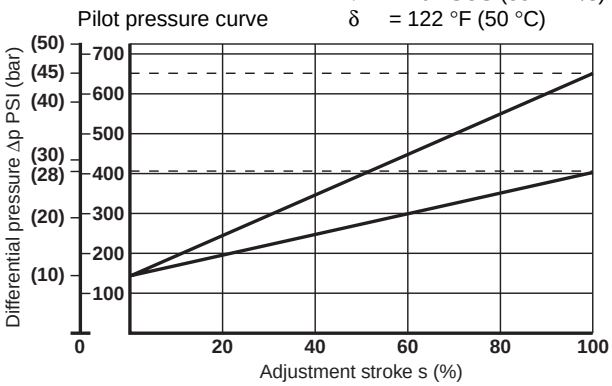
Application example

Port P_{St} is connected via a shuttle valve with the pilot circuit of control device, while port P_{HD} is connected via another shuttle valve into the main circuit of the axial piston pump. If the operating pressure exceeds the pre-load of the regulating spring for the start of control, the stepped piston moves against the spring set and so reduces the load on the pilot control spring and, in turn, the pilot pressure, so that the predetermined maximum drive power at a constant drive speed is never exceeded at any operating point.



Operating curves





Power curves

The power curves follow extensively the power curves laid down in DIN 42 973, and the rated powers of axial piston units with built on regulating devices.

For the various power curves available, according to unit see and size, see pages 3 to 5.

Power overshoot

The variation in regulated value of a power limiting valve is very small, as the response time is 0.02 sec. When used with con device S 3041, or the HD control, the actual variation is great as the minimum setting time of the pump is limited to 0.15 sec. or 0.2 sec. respectively.

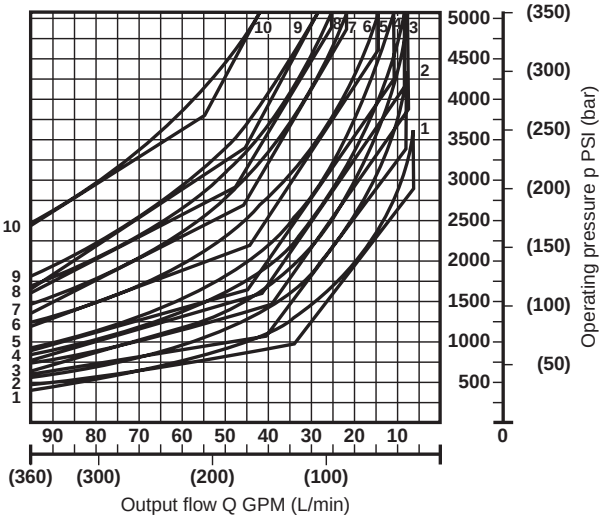
For further details of control tolerances, see catalogue sheet “Control Elements model S”, series E and C.

Power curves, series 5 (for HD control with constant horsepower control)

Size 250

Curve No.	Drive power P HP (kW)	Drive torque M lb-ft (Nm)
1	30 (22)	107 (145)
2	40 (30)	143 (194)
3	50 (37)	178 (242)
4	54 (40)	197 (267)
5	59 (44)	214 (290)
6	74 (55)	268 (363)
7	89 (66)	322 (437)
8	99 (74)	357 (485)
9	118 (88)	430 (582)
10	148 (110)	535 (726)

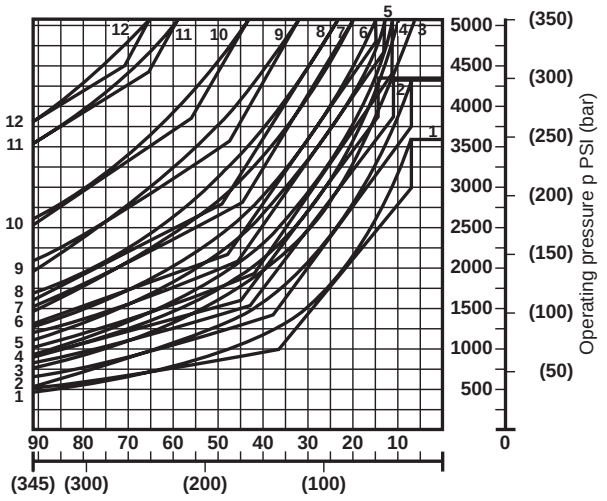
Output flow and drive power are taken for a standard speed n_N = 1450 rpm



Size 355

Curve No.	Drive power P HP (kW)	Drive torque M lb-ft (Nm)
1	30 (22)	160 (217)
2	40 (30)	210 (285)
3	50 (37)	267 (362)
4	54 (40)	294 (398)
5	59 (44)	321 (435)
6	74 (55)	400 (543)
7	89 (66)	477 (647)
8	99 (74)	535 (726)
9	118 (88)	637 (863)
10	148 (110)	796 (1079)
11	197 (147)	1071 (1452)
12	215 (160)	1165 (1580)

Output flow and drive power are taken for a standard speed n_N = 970 rpm

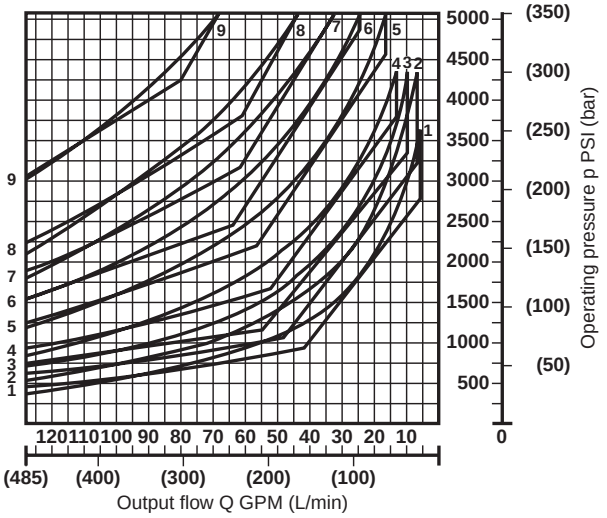


Power curves, series 5 (for HD control with constant horsepower control)

Size 500

Curve No.	Drive power P HP (kW)	Drive torque M lb-ft (Nm)
1	40 (30)	213 (289)
2	50 (37)	267 (362)
3	59 (44)	321 (435)
4	74 (55)	400 (543)
5	99 (74)	534 (724)
6	120 (90)	669 (907)
7	148 (110)	800 (1086)
8	177 (132)	962 (1304)
9	241 (180)	1308 (1774)

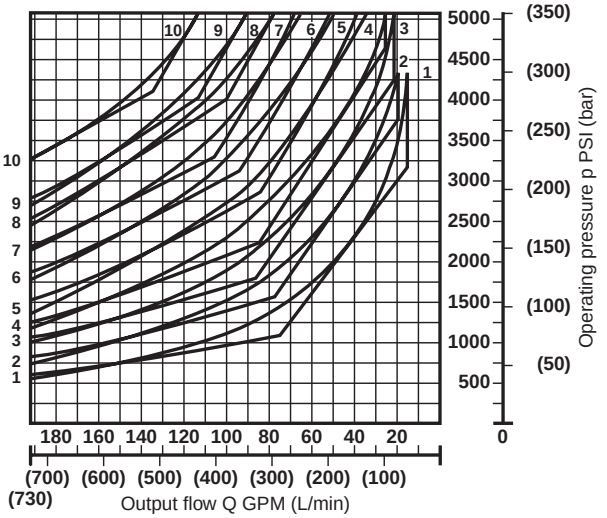
Output flow and drive power are taken for a standard speed n_N = 970 rpm



Size 1000

Curve No.	Drive power P HP (kW)	Drive torque M lb-ft (Nm)
1	74 (55)	521 (706)
2	100 (75)	687 (932)
3	120 (90)	861 (1167)
4	148 (110)	1035 (1403)
5	177 (132)	1244 (1687)
6	215 (160)	1519 (2060)
7	252 (188)	1766 (2394)
8	295 (220)	2070 (2806)
9	326 (243)	2279 (3090)
10	389 (290)	2836 (3845)

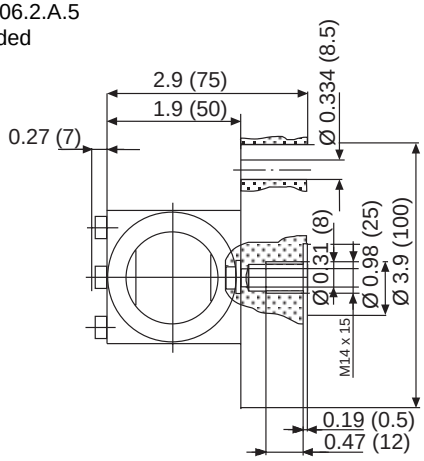
Output flow and drive power are taken for a standard speed n_N = 730 rpm

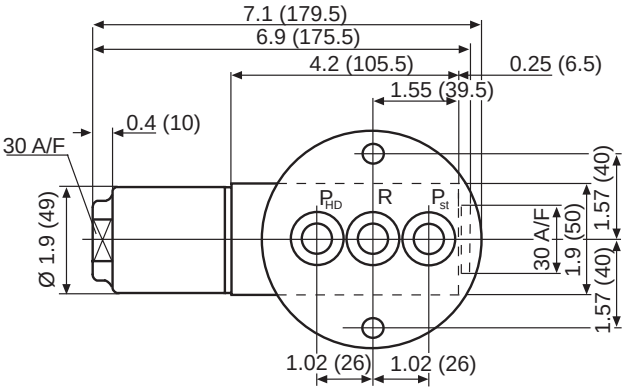


The control device is set to the nominal envelope curve with a variation of ± 5 % of the set value.

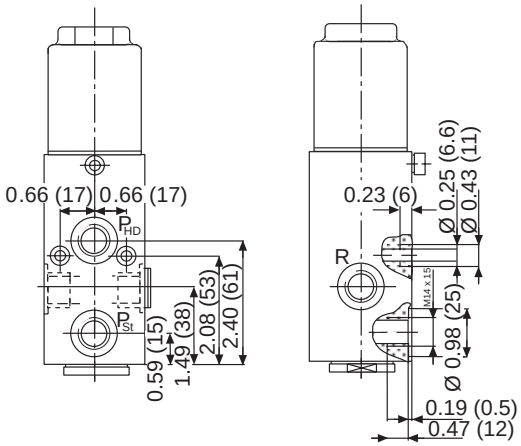
LV 06, Series 05

Model LV 06.2.A.5
with threaded
subplate

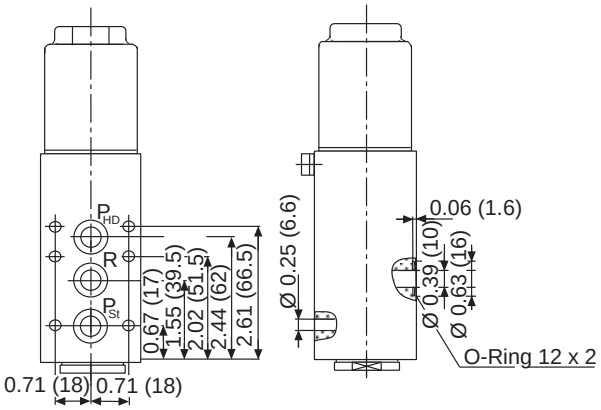




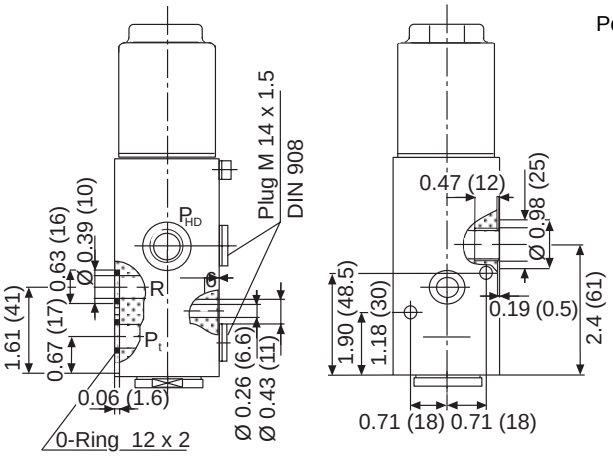
Model LV 06.1.0.5
with threaded
connections



Model LV 06.2.0.5
with O-ring
connections



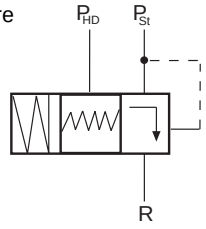
Model LV 06.3.0.5
with O-ring and
threaded connections



State model required when ordering

Port designation stamped in body.

p_{HD} = operating pressure
p_{St} = pilot pressure
R = return line



Notes

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