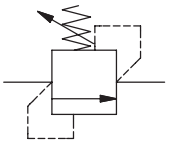
PRESSURE CONTROL VALVES

INTRODUCTION



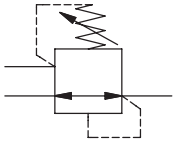
PRESSURE RELIEF VALVES

Pressure relief valves are normally closed hydraulic valves. They will open when a certain pressure is reached in order to dump the necessary flow to keep the hydraulic ducts pressurized.
Their primary function is to protect circuits and/or components (pumps, motors, actuators and pipes) from overloads and pressure peaks.
Pressure relief valves can be classified into two categories: direct acting and pilot operated valves.

Direct Acting Pressure Relief Valves are characterized by the presence of conical or differential poppets on which acts directly the pressure to be regulated.
These valves are simple, reliable and tough (the spring acts directly on the poppet). Their external dimensions result bigger than the pilot operated ones for flows over 50 lt/min.
Direct Acting Pressure Relief Valves find their application in circuits having less than 50 lt/min flows. They are particularly indicated for all those applications in which a good hydraulic sealing level is demanded (eg: hydraulic motors or actuators).

Pilot Operated Pressure Relief Valves are characterized by the presence of a logic element controller by a pilot stage.
These are valves able to control big flows combining reduced dimensions. A certain leakage, due to the coupling of the logic element, must be taken into account.
Pilot Operated Pressure Relief Valves are generally installed on pumps or hydraulic lines to control the maximum pressure.

Pressure Relief Valves must be considered also under the point of view of their reaction to the back-pressure.
Generally these valves equilibrate the differential ratio on the basis of their setting (pin-pout).
When a pressure relief valve is mounted before a pressurized line we must consider the effects of the back-pressure on its setting. In these cases the installation of compensated valves is advisable.
These valves, thanks to their internal design, will not be affected by the back-pressure on the return line, guaranteeing a control of the maximum feeding pressure considering only their setting (Pin).



PRESSURE REDUCING VALVES

Pressure reducing valves are 3 ways normally open hydraulic valves able to feed a secondary circuit with a lower pressure than the main one.

PRESSURE CONTROL VALVES

The reduced pressure acts on a cylindric spool kept in open position by a spring.
When the pressure of the secondary circuit overcomes the force of the spring the spool will move, assuring so that the pressure in the secondary line will not increase above its setting.

The third way, typical of pressure reducing valves, is connected to the tank in the direct acted type, and sometimes in the pilot operated ones as well.
This connection is necessary to unload the exceeding flow in case the pressure of the secondary circuit would increase above its setting.

There are two different types of design for these valves as well: direct acted and pilot operated.

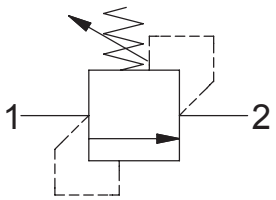
Direct acted pressure reducing valves are characterized by the presence of a cylindric spool on which the pressure to be regulated acts directly.
Thanks to their simple design they are very tough and reliable, particularly indicated for feeding the pilot circuits that do not imply a continous oil flow.
Their main application is on feeding units for earth moving servo-controls.

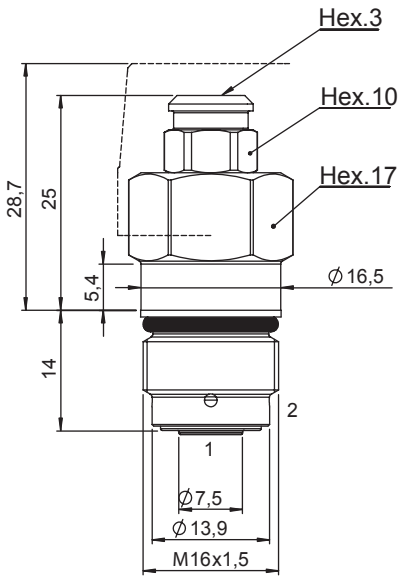
Pilot operated pressure reducing valves are characterized by the presence of a logic element controller by a pilot stage.
Thanks to the logic element it is possible to guarantee a reduced pressure even when big amounts of flow are present.
Depending on the type of spool it is possible to design the cartridge both in the basic way and in the way that combines the pressure reducing to the pressure relieving process.

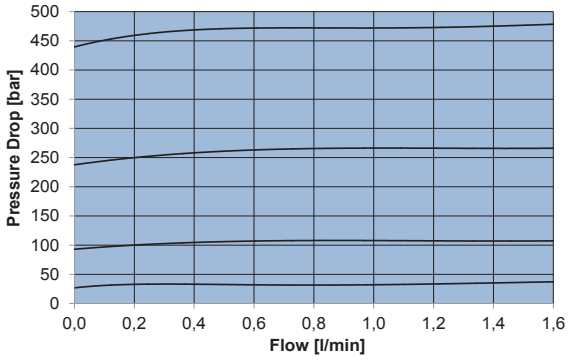
It is very important to consider that the setting pressure of the pressure reducing valves increases when some backpressure is present in the drain line.
To avoid this we advise to connect the drain line directly to the tank just in case some pressure losses due to filters and heat exchangers would be present.

DIRECT ACTING RELIEF VALVE

- Flow . . . . . **1,5 l/min**
- Max working pressure. . . . . **450 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque. . . . . **40 Nm**
- Weight . . . . . **0,05 Kg**
- Tamper proof cap. **cod.9021015101**
- Cavity . . . . . **S000020** page **232**







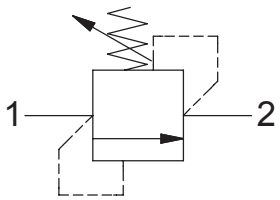
Ordering code

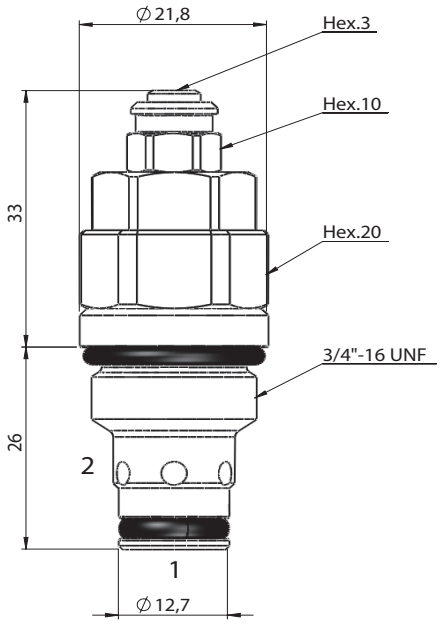
0 0 2 1 0 ☐ 0 0 E 0

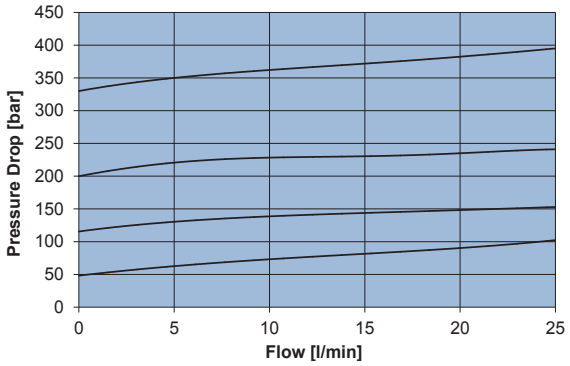
SPRINGS	0	1	2	3
Setting range min.-max. [bar]	5 - 30	30 - 100	100 - 250	250 - 450
Pressure Increase [bar/turn]	10	56	136	250
Standard setting 20 cc/min [bar]	20	50	100	250

DIRECT ACTING RELIEF VALVE

- Flow . . . . . **20 l/min**
- Max working pressure. . . . . **420 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque. . . . . **40 Nm**
- Weight . . . . . **0,085 Kg**
- Tamper proof cap. **cod.9021015101**
- Cavity . . . . . **C220000** page **208**
- Body. . . . . **171202** page **186**







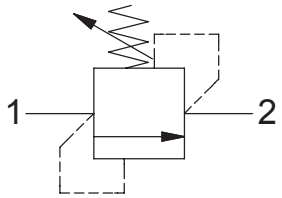
Ordering code

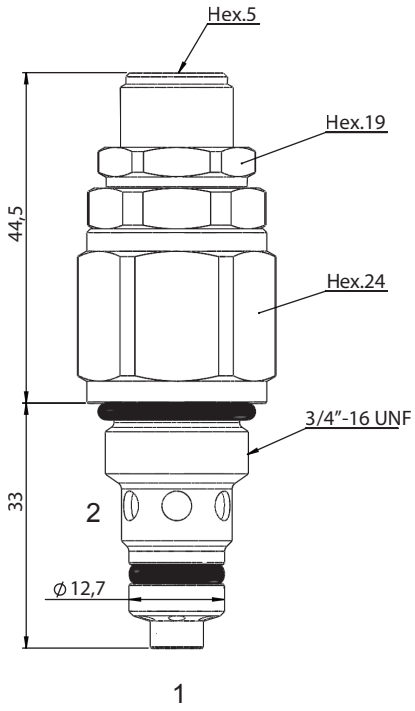
0 0 2 2 0 ☐ 1 0 0 0

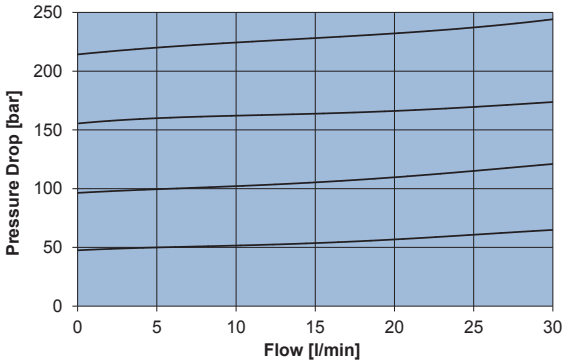
SPRINGS	1	2	3
Setting range min.-max. [bar]	5 - 160	40 - 220	50 - 350
Pressure Increase [bar/turn]	36	34	63
Standard setting 4 l/min [bar]	50	100	250

DIRECT ACTING RELIEF VALVE

- Flow . . . . . **30 l/min**
- Max working pressure . . . . . **350 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **40 Nm**
- Weight. . . . . **0,145 Kg**
- Cavity . . . . . **C222000** page **209**







Note
This carttridge must be installed in to the SAE 08/2 long cavity,according the specifications of C222000.

This type of valve is characterized by a dumped plunger that enable stable relief characteristics.

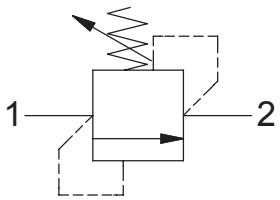
Ordering code

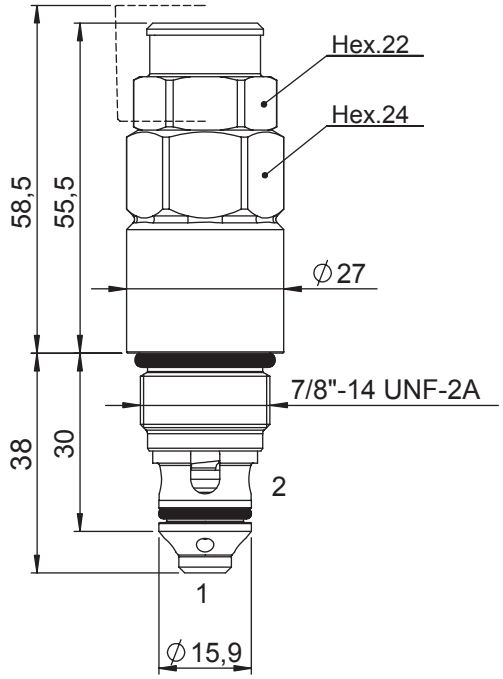
0 0 2 2 3 ☐ 0 0 0 0

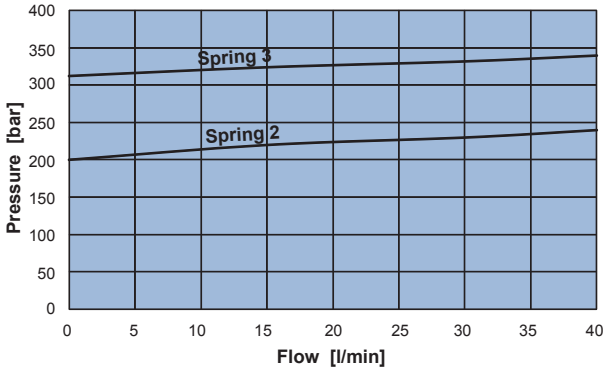
SPRINGS	0	1	2	3
Setting range [bar]	15-50	50-120	120-200	200-350
Pressure Increase [bar/turn]	8	20	33	59
Standard setting 4 l/min [bar]	25	100	150	250

DIRECT ACTING RELIEF VALVE

- Flow . . . . . **40 l/min**
- Max working pressure . . . . . **410 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **60 Nm**
- Weight. . . . . **0,23 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**
- Cavity . . . . . **C232000** page **212**







Note
This carttridge must be installed in to the SAE 10/2 long cavity,according the specifications of C232000.

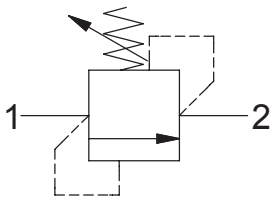
Ordering code

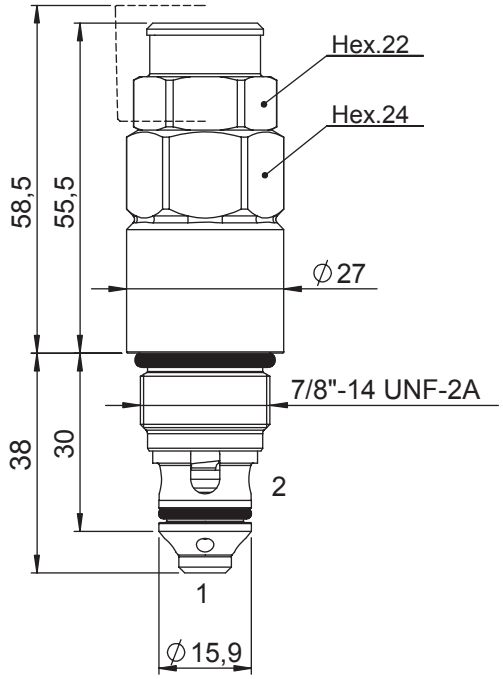
0 0 2 3 3 ☐ 0 0 0 0

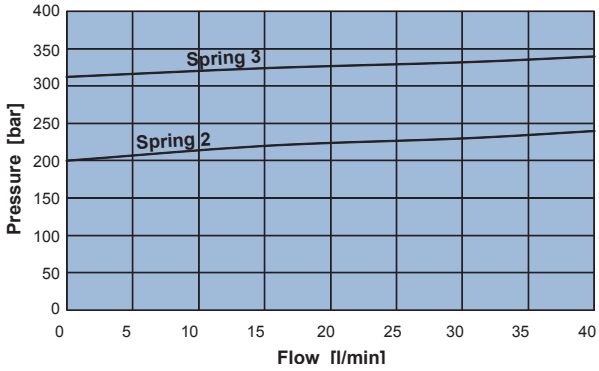
SPRINGS	1	2	3
Setting range min.-max. [bar]	40 - 140	120 - 250	220 - 410
Pressure Increase [bar/by turn]	23	31	53
Standard setting 4 l/min [bar]	50	150	250

DIRECT ACTING RELIEF VALVE WITH HARDENED SEALING BODY

- Flow . . . . . **40 l/min**
- Max working pressure. . . . . **410 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **60 Nm**
- Weight . . . . . **0,23 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**
- Cavity . . . . . **C232000** page **212**







Note

Hardened body cartridge, suggested for heavy duty applications (HD) and for lifting equipment.

For lifting equipments, cleanliness class ISO 4406 17/14 (NAS 1653 class 8) or better is recommended.

This carttridge must be installed into the SAE 10/2 long cavity,according the specifications of C232000.

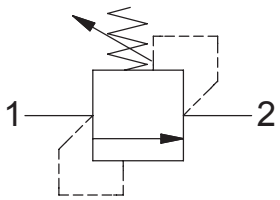
Ordering code

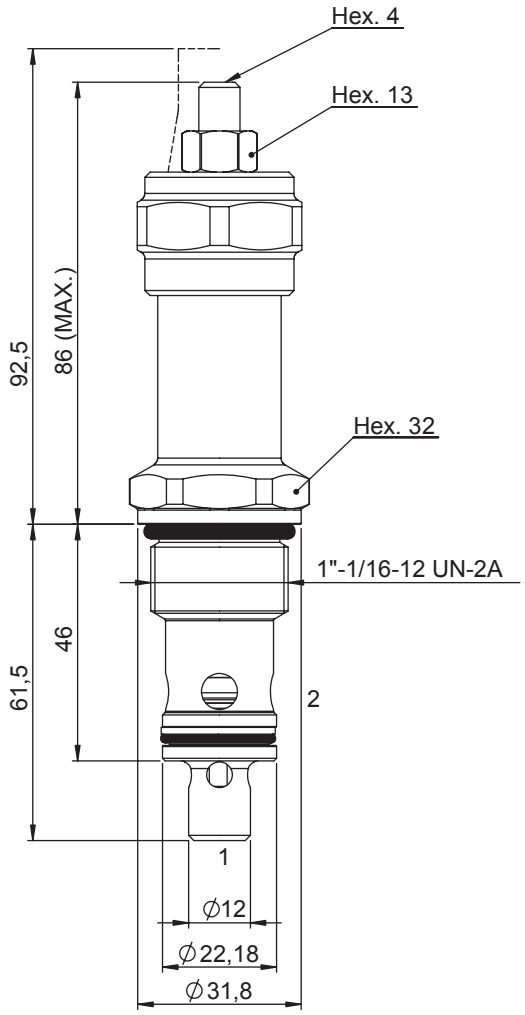
0 0 2 3 4 ☐ 0 0 0 0

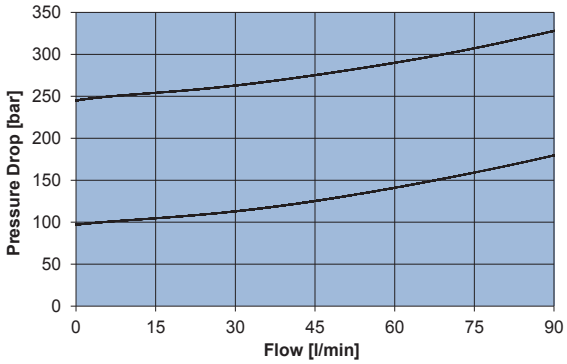
SPRINGS	1	2	3
Setting range min.-max. [bar]	40 - 140	120 - 250	220 - 410
Pressure Increase [bar/by turn]	23	31	53
Standard setting 4 l/min [bar]	50	150	250

DIRECT ACTING RELIEF VALVE

- Flow . . . . . **90 l/min**
- Max working pressure . . . . . **350 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **90 Nm**
- Weight. . . . . **0,35 Kg**
- Tamper proof cap. . . . . **cod. 9021020250**
- Cavity . . . . . **C240000** page **213**
- Body. . . . . **171402** page **196**







Note
Axial hole of the C240000 cavity: minimum Ø19mm.

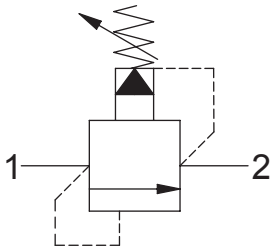
Ordering code

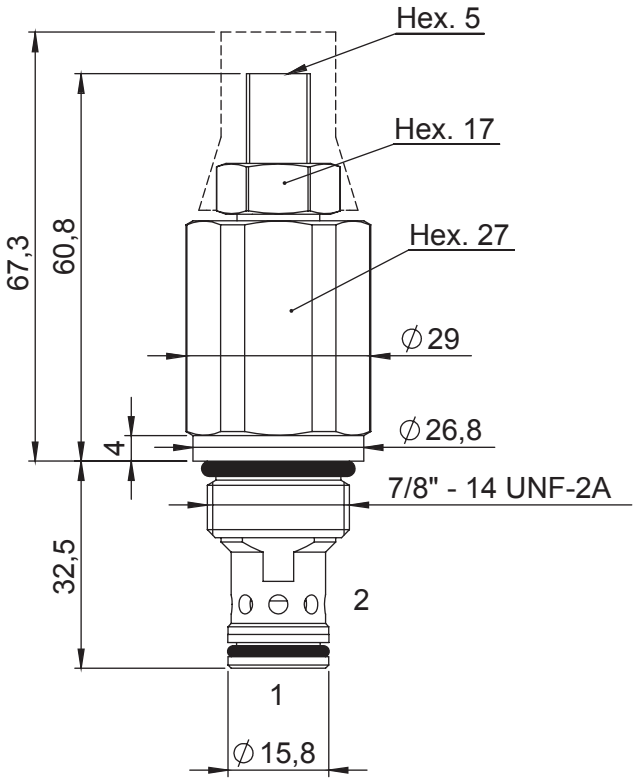
0 0 2 4 0 ☐ 0 0 0 0

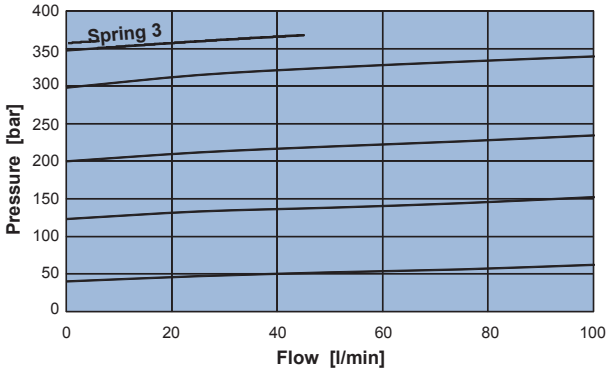
SPRINGS	2	3
Setting range min.-max. [bar]	60 - 250	200 - 350
Pressure Increase [bar/by turn]	22	56
Standard setting 4 l/min [bar]	100	300

PILOT OPERATED RELIEF VALVE

- Flow . . . . . **100 l/min**
- Max working pressure. . . . . **350 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **60 Nm**
- Weight . . . . . **0,25 Kg**
- Tamper proof cap. . . . . **cod. 4029250280**
- Cavity . . . . . **C230000** page **210**
- Body. . . . . **171302** page **191**







Ordering code

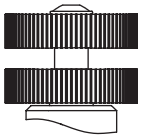
0 0 3 3 0 □ 0 □ 0 0

SPRINGS	3
Setting range min.-max. [bar]	20 - 350
Pressure Increase [bar/by turn]	136
Standard setting 4 l/min [bar]	100

0

Hex socket screw

2

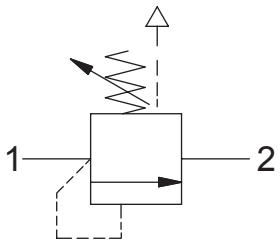


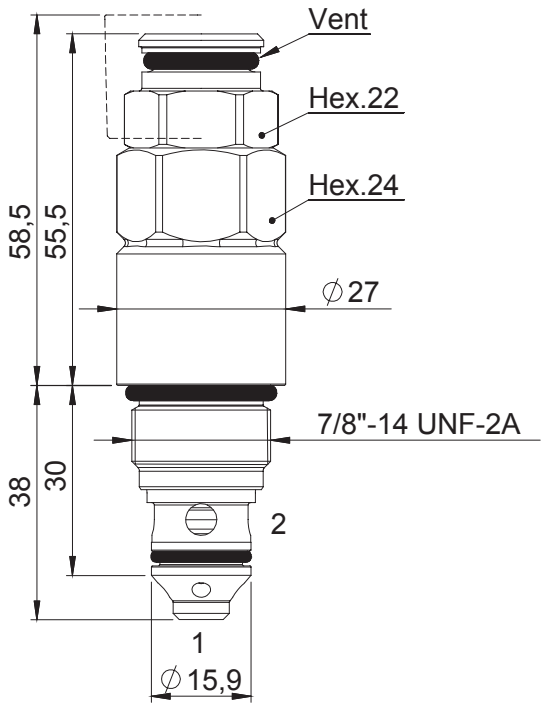
Handknob

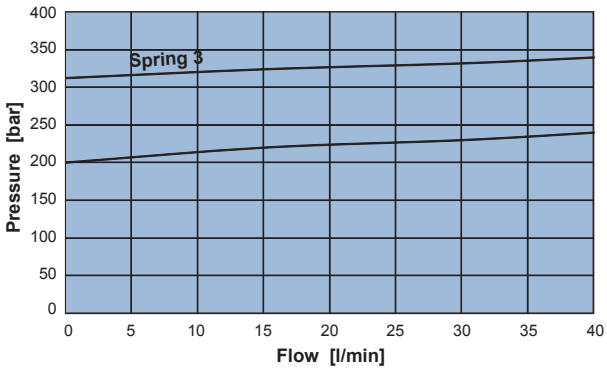
Adjustments

DIRECT ACTING COMPENSATED RELIEF VALVE WITH HARDENED SEALING BODY

- Flow . . . . . **40 l/min**
- Max working pressure . . . . . **410 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **60 Nm**
- Weight. . . . . **0,23 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**
- Cavity . . . . . **C232000** page **212**







Note:
Hardened body cartridge, suggested for heavy duty applications (HD) and for lifting equipment.

For lifting equipments, cleanliness class ISO 4406 17/14 (NAS 1653 class 8) or better is recommended.

This carttridge must be installed into the SAE 10/2 long cavity,according the specifications of C232000.

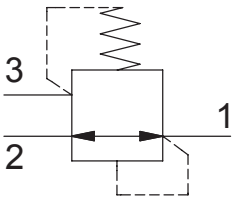
Ordering code

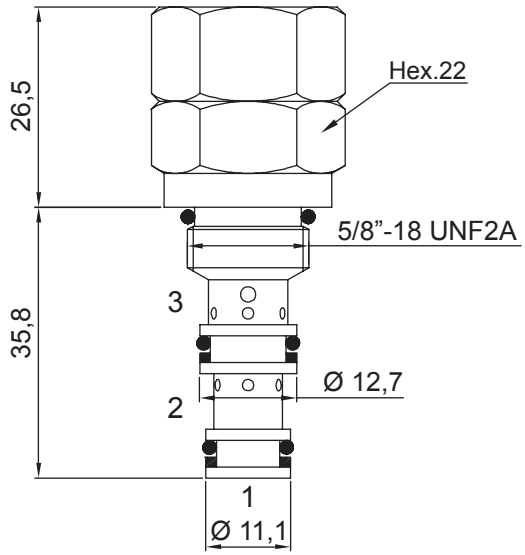
0 0 2 3 5 ☐ 0 0 0 0

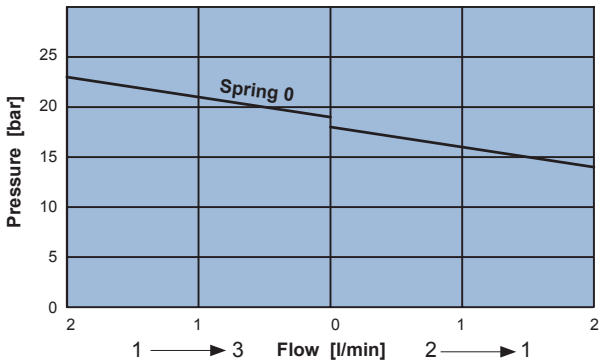
SPRINGS	2	3
Setting range min.-max. [bar]	120 - 250	220 - 410
Pressure Increase [bar/by turn]	31	53
Standard setting 4 l/min [bar]	150	250

FIX SETTING DIRECT ACTING PRESSURE REDUCING VALVE

- Flow . . . . . **2 l/min**
- Max working pressure in 2 . . . . . **350 bar**
- Max working pressure in 1 . . . . . **18 bar**
- Max working pressure in 3 . . . . . **1 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **15 Nm**
- Weight . . . . . **0,10 Kg**
- Cavity . . . . . **C310000** page **217**







Note:
- In case of different setting from standard, contact NEM customer service.

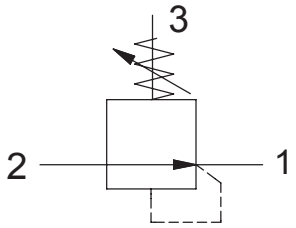
Ordering code

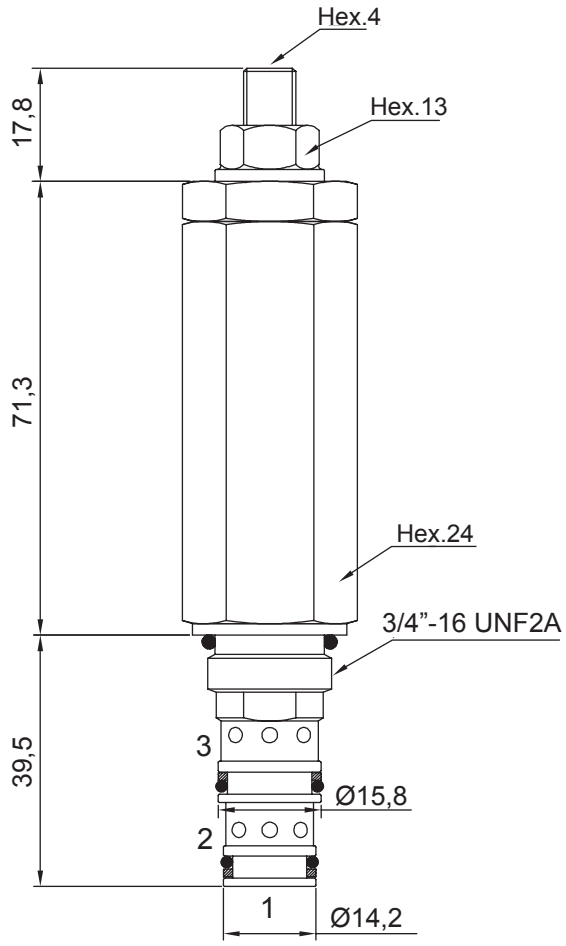
0 1 2 1 2 [ ] 0 3 0 0

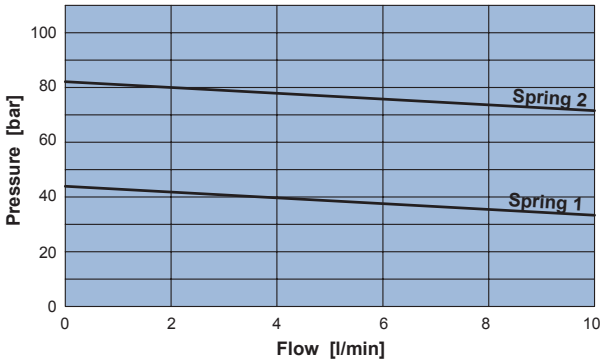
SPRINGS	0
Standard setting [bar]	18

DIRECT ACTING PRESSURE REDUCING VALVE

- Flow . . . . . **10 l/min**
- Max working pressure in 2 . . . . . **350 bar**
- Max working pressure in 1 . . . . . **100 bar**
- Max working pressure in 3 . . . . . **1 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **40 Nm**
- Weight . . . . . **0,25 Kg**
- Cavity. . . . . **C320000** page **218**
- Body. . . . . **171212** page **187**







Note:
Unidirectional pressure reducing cartridge (without embedded relief function).

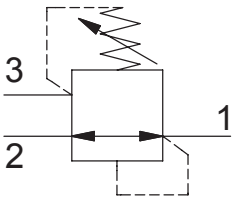
Ordering code

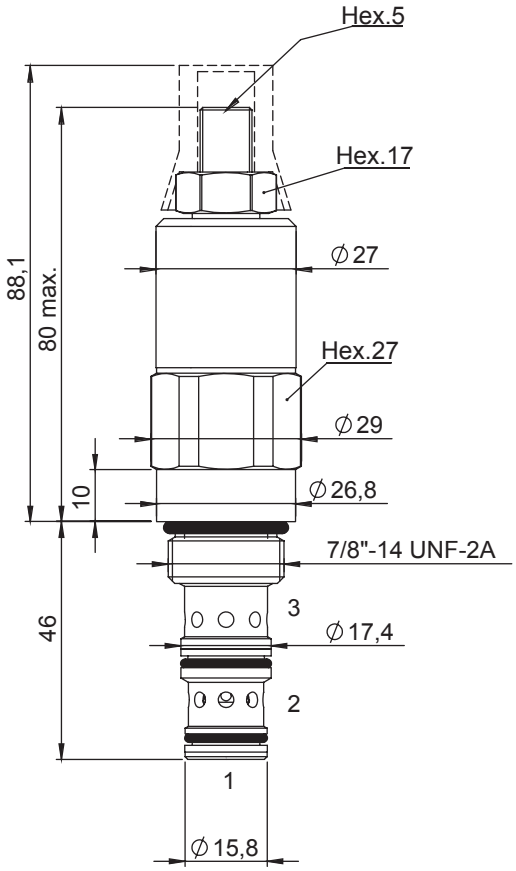
0 1 2 2 1 ☐ 0 0 0 0

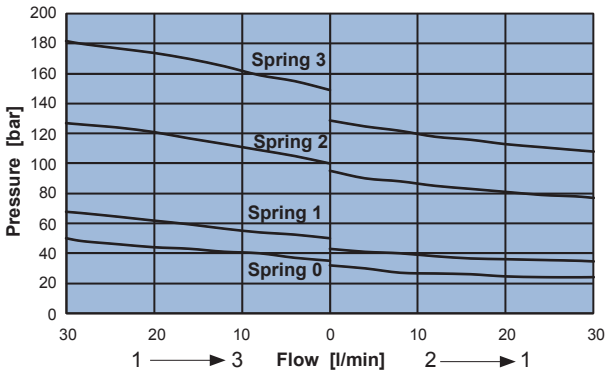
SPRINGS	1	2
Setting range [bar]	5 - 50	20 - 100
Pressure Increase [bar/turn]	7	17
Standard setting [bar]	25	50

DIRECT ACTING PRESSURE REDUCING VALVE

- Flow . . . . . **30 l/min**
- Max working pressure in 2 . . . . . **350 bar**
- Max working pressure in 1 . . . . . **150 bar**
- Max working pressure in 3 . . . . . **1 bar**
- Seals . . . . . **NBR and PTFE**
- Cartridge tightening torque . . . . . **50 Nm**
- Weight . . . . . **0,31 Kg**
- Leakage with 350 bar in 2: . . . . . **70 cc/min**
- Tamper proof cap. . . . . **cod. 4029250280**
- Cavity . . . . . **C330000** page **220**
- Body. . . . . **171312** page **192**







Ordering code

0 1 2 3 2 ☐ 0 ☐ ☐ 0

SPRINGS	0	1	2	3
Setting range [bar]	5 - 30	15 - 55	20 - 103	30 - 150
Pressure Increase [bar/turn]	5	8	20	30
Standard setting [bar]	25	50	100	140

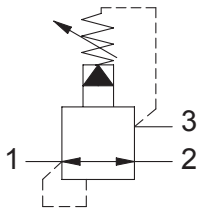
Adjustments

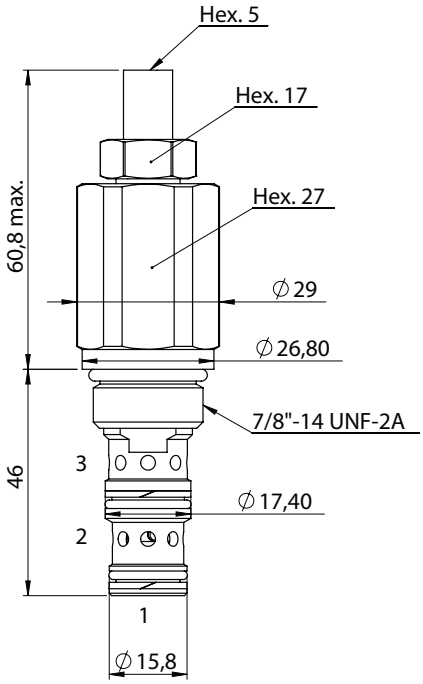
0	2
Hex socket screw	Handknob

0	1
Without filter	With filter

PILOT OPERATED PRESSURE REDUCING VALVE

- Flow. . . . . .**60 l/min**
- Max working pressure in 2 . . . . . **350 bar**
- Max working pressure in 1 . . . . . **350 bar**
- Max working pressure in 3 . . . . . **1 bar**
- Seals . . . . . .**NBR and PTFE**
- Cartridge tightening torque. . . . . .**60 Nm**
- Weight. . . . . **0,25 Kg**
- Tamper proof cap. . . . . .**cod. 4029250280**
- Cavity . . . . . **C330000** page **220**
- Body. . . . . **171312** page **192**





Ordering code

0 1 3 3 2 ☐ 0 ☐ 0 0

SPRINGS	3
Setting range min.-max. [bar]	20 - 350
Pressure Increase [bar/by turn]	136
Standard setting 4 l/min [bar]	100

0 — **Hex socket screw**

2 — **Handknob**

Adjustments