

Pressure reducing valve type ADM

Product documentation



Operating pressure p_{\max} :

315 bar

Flow rate Q_{\max} :

60 lpm



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1**Overview of pressure reducing valves type ADM**

Pressure reducing valves are a type of pressure valve. They maintain a largely constant outlet pressure even at a variable (higher) inlet pressure. In hydraulic systems with multiple consumers, each individual consumer can be assigned a pressure reducing valve. This way, each consumer's pressure can be set to a lower level separately.

The pressure reducing valve type ADM is directly controlled. The valves have an override compensation. If for instance the secondary pressure rises above the set value due to external forces, then they act like a pressure-limiting valve. There is a design-related leakage flow.

Features and benefits

- Integrated overpressure function
- Various adjustment options

Area of application

- General hydraulic systems
- Fixtures
- Test benches

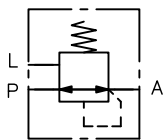


Pressure reducing valve type ADM

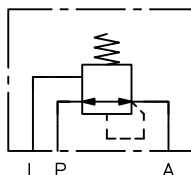
2 Available versions

Circuit symbol

ADM
Pipe connection



ADM ... P
Manifold mounting



Ordering example

ADM 22	D	R	-110
			Pressure setting (bar)
			2.3 "Pressure adjustment"
			2.2 "Pressure range"
			2.1 "Basic type and size"

i NOTE

If no pressure setting is stated, the valve is set to the maximum value of the corresponding pressure range ex-works.

2.1 Basic type and size

Type	Flow rate P → A Q_{\max} (lpm)	Pressure p_{\max} (bar) at port P	Connections per ISO 228-1	
			P, A	L
Pipe connection				
ADM 11	12	315	G 1/4	G 1/4
ADM 21	25		G 1/4	
ADM 22	25		G 3/8	
ADM 32	60		G 3/8	
ADM 33	60		G 1/2	
Manifold mounting				
ADM 11 P	12	315	see Chapter 4.2, "Valve for manifold mounting"	
ADM 22 P	25			
ADM 33 P	60			

2.2 Pressure range

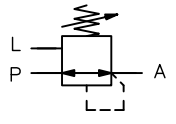
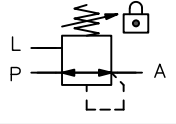
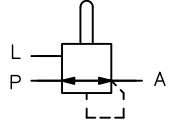
Coding	Pressure range p_A (bar)		
	ADM 11	ADM 2..	ADM 3..
A	160 ... 250	160 ... 250	130 ... 250
C	60 ... 160	45 ... 160	30 ... 160
D	30 ... 120	30 ... 120	25 ... 100
F	10* ... 50	10* ... 30	15* ... 25

* Flow rate only up to approx. 40% of Q_{max}

i NOTE

The pressure values apply when $Q_{p \rightarrow A} = 0$ lpm, i.e. the consumer is in end position and is not moving (static pressure).
When $Q \neq 0$, the p_A pressure drops slightly as long as the consumer has not yet reached its end position.
see Chapter 3.4, "Characteristic lines"

2.3 Pressure adjustment

Coding	Description	Circuit symbol
Without coding	Standard, tool adjustable	
R	Manually adjustable (wing bolt and wing nut)	
V	Turning knob (self-locking)	
H	Turning knob, lockable (key in line with factory specifications for the automotive industry; included in the scope of delivery, with an additional key held by the authorised plant personnel)	
T	Pin (with aluminium spring dome), ADM(P) 11 only if drain port L is routed to the tank in an unpressurised state (<20 bar)	
TS	Pin (with steel spring dome), ADM(P) 11 only if counter-pressure at drain port L is greater than 20 bar	

3 Parameters

3.1 General data

Designation	Pressure reducing valve
Design	Directly controlled spool valve with override compensation.
Model	Single valve for pipe connection or manifold mounting
Material	<ul style="list-style-type: none"> • Valve block nitrided steel • Bore diamond honed • Control piston made of stainless steel, hardened and ground • Bore and piston deburred by polishing • Spring dome made of zinc die casting
Attachment	Mounting thread or tapped holes, see Chapter 4, "Dimensions"
Installation position	Any
Ports/connections	<ul style="list-style-type: none"> ▪ P = Pump (inlet) ▪ A = Consumer ▪ L = Leakage (unpressurised to the tank, see Chapter 3.3, "Pressure and volumetric flow") <p>Connecting thread: P, A, L: see Chapter 2.1, "Basic type and size"</p>
Flow direction	<p>Working direction P → A Free return flow A → P only permissible for small flow rates below about 50% of Q_{max}. Otherwise, a bypass check valve must be installed for free return flow and for viscosities > 150 mm²/s (see Chapter 3.4, "Characteristic lines")</p> <p>Overdrive A → L possible: up to about 25 ... 30% of Q_{max} with ADM 3.. up to about 50 ... 60% of Q_{max} with ADM 11 and ADM 2..</p>
Hydraulic fluid	<p>Hydraulic fluid, according to DIN 51 524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 4 - 1500 mm²/s Optimal operating range: approx. 10 - 500 mm²/s Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.</p>
Cleanliness level	<p>ISO 4406 20/17/14</p>
Temperatures	<p>Environment: approx. -40 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -40°C is permissible (observe start viscosities) as long as the steady-state temperature is at least 20K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.</p>

3.2 Weight

Pipe connection	Type	
	ADM 11	= 0.6 kg
	ADM 21	= 0.7 kg
	ADM 22	= 0.7 kg
	ADM 32	= 1.0 kg
	ADM 33	= 1.0 kg
Manifold mounting	Type	
	ADM 11 P	= 0.6 kg
	ADM 22 P	= 0.9 kg
	ADM 33 P	= 1.1 kg

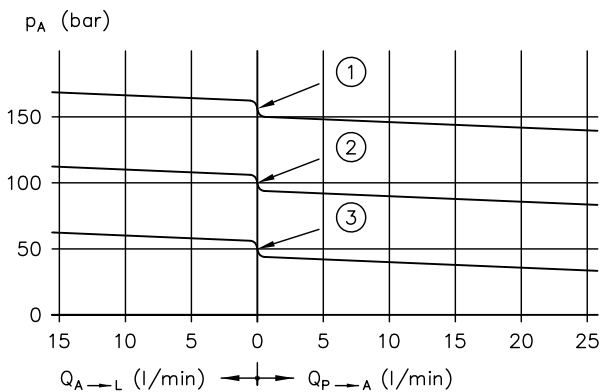
3.3 Pressure and volumetric flow

Operating pressure	<ul style="list-style-type: none"> ▪ On the pump side $p_{\max} = 315$ bar ▪ Consumer side $p_{A \max}$, see Chapter 2.2, "Pressure range" ▪ Reflux $p_L \leq 20$ bar
	<p>! DAMAGE Pressure at L is added to pressure at A.</p>
Flow rate	see Chapter 2.1, "Basic type and size"

3.4 Characteristic lines

Viscosity of the hydraulic fluid approx. 50 mm²/s

$p_A - Q_{P \rightarrow A}$ - Characteristic lines (example type ADM 22 C)

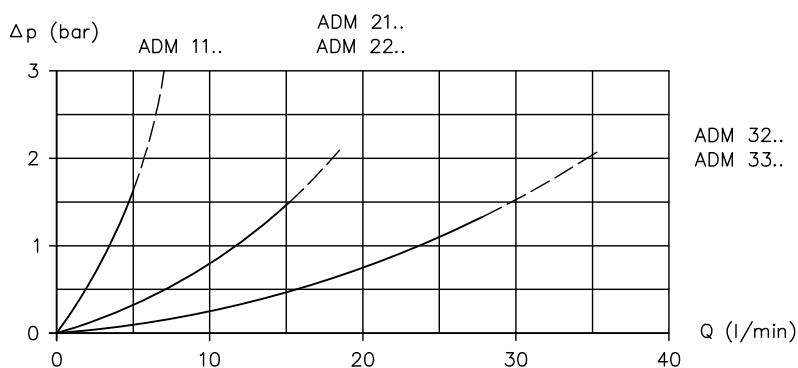


$Q_{A \rightarrow L}$ overdrive (lpm), $Q_{P \rightarrow A}$ consumer current (lpm); p_A pressure (bar)

- 1 Setting 160 bar
- 2 Setting 100 bar
- 3 Setting 50 bar

An overdrive occurs when an external force exceeding the p_A setting acts on the consumer and pushes the flow back in the A direction. The return flow is discharged via $A \rightarrow L$ ab, the consumer pressure p_A rises slightly above the pressure setting.

Δp -Q characteristic line for free return flow $A \rightarrow P$



Q flow rate (lpm); Δp flow resistance (bar)

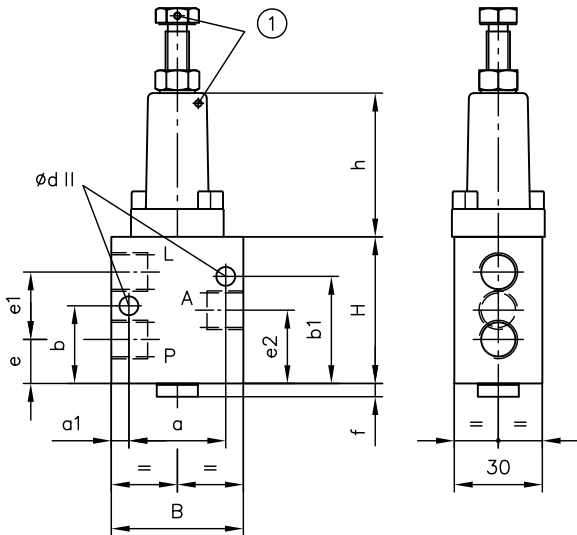
DAMAGE

Note information for flow direction (see Chapter 3.1, "General data").

4 Dimensions

All dimensions in mm, subject to change.

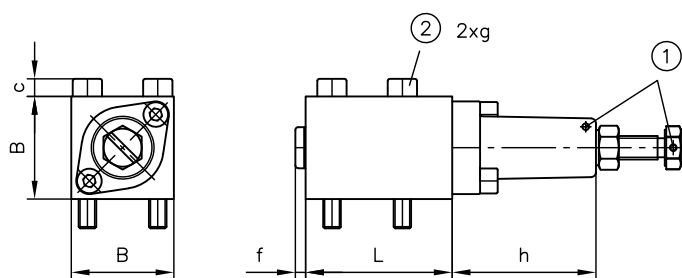
4.1 Valve for pipe connection



1 Sealing option

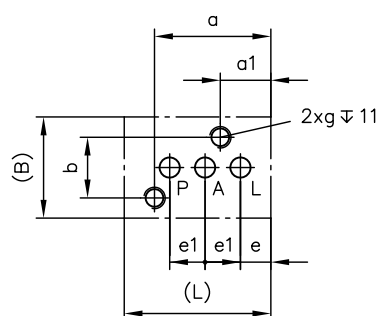
Type	B	H	a	a1	b	b1	$\varnothing d$	e	e1	e2	f	h	Connections per ISO 228-1	
													P, A	L
ADM 11	45	50	33	6	26.5	36.5	6.5	15	23	25	3.5	49.5	G 1/4	G 1/4
ADM 21 ADM 22	50	58	38	6	32	42	6.5	18	26	28	3.5	49.5	G 3/8	G 1/4
ADM 32 ADM 33	60	70	40	10	10	58	9	28	28	40	8	59.5	G 1/2	G 1/4

4.2 Valve for manifold mounting

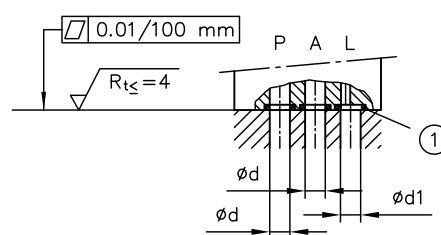


- 1 Sealing option
- 2 For tightening torque see table below

Hole pattern



Base plate

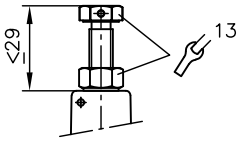


- 1 O-ring NBR 90 Sh

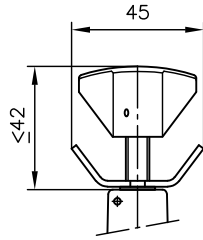
Type	B	L	a	a1	b	c	∅d	∅d1	e	e1	f	g	h	Tightening torque (Nm)	O-ring			Connections per ISO 228-1		
															P, A	L		P, A	L	
ADM 11 P	35	50	24	17	24	6	6	6	10	12.5	3.5	M6x45	41	9.5	7.65x1.78		G 1/4	G 1/4		
ADM 22 P	40	58	26	20	24	6	8	8	12	14	3.5	M6x50	51.5	9.5	9.25x1.78		G 3/8	G 1/4		
ADM 33 P	40	70	40	14	28	8	10	8	9	16	8	M8x50	51.5	23	12x2	9.25x1.78	G 1/2	G 1/4		

4.3 Pressure adjustment

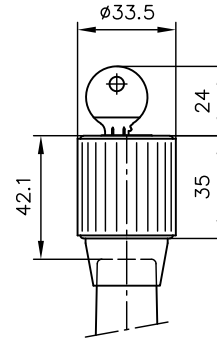
Adjustment device without coding



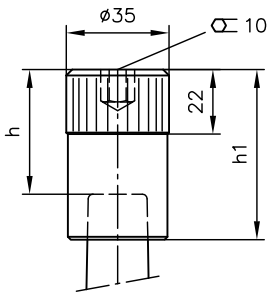
Adjustment device coding R



Adjustment device coding H



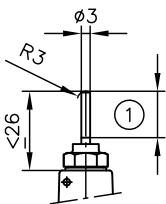
Adjustment device coding V



Type	h	h1
ADM 11	41	58
ADM 21	41	58
ADM 22	41	58
ADM 32	56	64
ADM 33	56	64

Coding pressure range	$\Delta p/\text{revolution (bar/R)}$	
	ADM 11	ADM 2.. / ADM 3..
A	55	49
C	43	14
D	12	11
F	4	2

Adjustment device coding T, TS



1 Stroke

! DAMAGE

Do not exceed the actuation end position!

Actuation in axial direction only (lateral forces not permissible).

Design the actuating element pressing the pin accordingly or provide it with its own end stop.

Coding pressure range	Actuation	
	Stroke (mm)	Force (N)
A	7.5	570
C	12.5	385
D	13	260
F	16.5	67

5 Installation, operation and maintenance information

Observe the document B 5488 "General operating instructions for assembly, commissioning, and maintenance."

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this document.

Essential requirements for the product to function correctly and safely:

- ▶ All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ▶ The product must only be assembled and put into operation by specialist personnel.
- ▶ The product must only be operated within the specified technical parameters described in detail in this document.
- ▶ All components must be suitable for the operating conditions when using an assembly.
- ▶ The operating instructions for the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
 - ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).



DANGER

Sudden movement of the hydraulic drives when disassembled incorrectly

Risk of serious injury or death

- ▶ Depressurise the hydraulic system.
- ▶ Perform safety measures in preparation for maintenance.

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.

The instructions for the complete technical system must also always be followed.



DAMAGE

- ▶ Read the documentation carefully before usage.
- ▶ The documentation must be accessible to the operating and maintenance staff at all times.
- ▶ Keep documentation up to date after every addition or update.



CAUTION

Overloading components due to incorrect pressure settings.

Risk of minor injury.

- Pay attention to the maximum operating pressure of the pump and the valves.
- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the product. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Swarf
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

! DAMAGE

New hydraulic fluid from the manufacturer may not have the required purity.

Damage to the product is possible.

- ▶ Filter new hydraulic fluid to a high quality when filling.
- ▶ Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level [see Chapter 3, "Parameters"](#)).

Additionally applicable document: [D 5488/1](#) Oil recommendations

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

References

Additional versions

- Pressure reducing valve type ADC, ADM, ADME, AM: D 7458
- Pressure-reducing valve type CDK: D 7745
- Pressure-reducing valve type DK, DZ and DLZ: D 7941

Application

- Compact pump type MP: D 7200
- Directional spool valve bank type SWS: D 7951
- Compact hydraulic power pack type KA and KAW size 2: D 8010
- Proportional directional spool valve, type PSL and PSV size 2: D 7700-2
- Proportional directional spool valves types PSL/PSV/PSM, size 3: D 7700-3
- Proportional directional spool valve, type PSL, PSM and PSV size 5: D 7700-5
- Compact hydraulic power pack type HK 4: D 7600-4
- Compact hydraulic power pack type MPN and MPNW: D 7207
- Compact hydraulic power pack type HKL and HKLW: D 7600-3L

