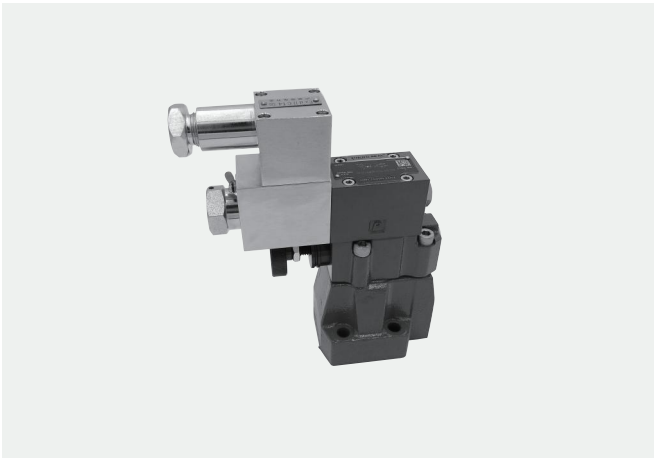
Explosion-proof Pilot Operated Unloading Pressure Relief Valve

Model: G-DAW...5X



- Size 10 to 32
- Maximum working pressure 315 bar
- Maximum flow rate 240 L/min

Contents

Function description, sectional drawing	02
Functional symbols	03
Models and specifications	03
Technical parameters	04
Characteristic curve	05
Component size	06-08
Application example	09

Features

- For subplate mounting
- For manifolds mounting
- 4 adjusting elements
- 4 pressure ranges
- Unload by the installed explosion-proof directional valve

Function description, sectional drawing

The G-DAW pressure control valve is pilot operated pressure shut-off valve. It is used to switch the pump flow to pressureless bypass when the accumulator loading pressure is reached. The other application of the valve is in high/low pressure pump system. In this application, the low pressure is switched to pressureless bypass when pressure reaches the high pressure setting value.

The valve is composed of main valve (1) with main spool assembly (3), pilot valve (2) with pressure adjusting element and check valve (4). For size 10 valve, the check valve (4) is installed in main valve (1). For size 25 and 32, the check valve (4) is built into a separate subplate installed under the main valve (1).

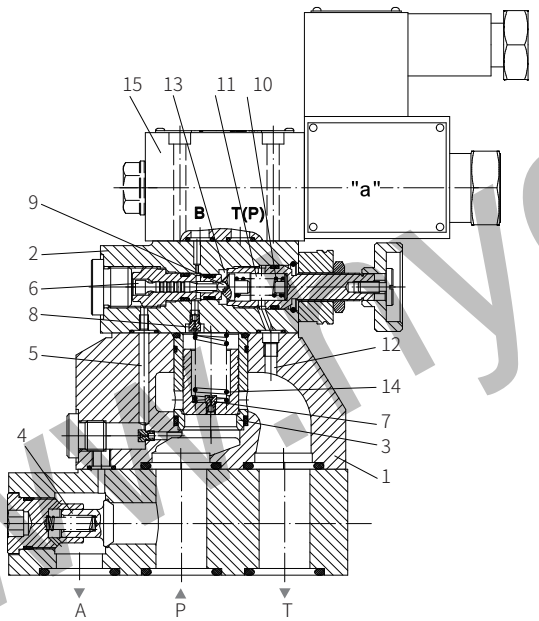
Diverting the pump flow from P to A - P to T

The pump supply oil for hydraulic system (P to A) via check valve (4). The pressure in port A acts on pilot valve spool (6) via control line (5). At same time, pressure in port P passes to the spring chamber of main spool (3) and conical spool (9) of pilot valve (2) via orifices (7) and (8). The conical spool lifts its valve seat against the spring force(10) when the setting cut-off pressure of the hydraulic system is reached. The fluid flows into spring chamber (11) via orifices (7) and (8), or the oil returns to tank external via control line (12) in model G- DAW...5XJ...Y.

Due to orifices (7) and (8), there is pressure drop in the main spool (3). The main spool (3) lifts off its seat and opens the connection from P to T. and the check valve (4) closes the connection from A to P. Now the poppet valve (9) is kept opening by the system pressure via pilot valve spool (6).

Diverting the pump fluid from P to T - P to A.

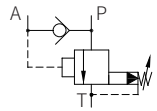
The area of the pilot spool (6) is 10% or 17% greater than the effective area of the conical spool (9) , thus the effective force on the pilot valve spool (6) is 10% or 17% greater than the effective force on the conical spool (9). When the actuator pressure drop to equal the cut-off pressure of the valve that corresponds to the switching pressure differential, the spring (10) pushes the poppet valve(9) on to its seat. The pressure is built up on the spring loaded side of the main spool (3). In conjunction with spring (14), the main spool (3) is closed and the connection from port P to T is isolated. The pump flow passes again via the check valve (4) into the hydraulic system (P to A). The solenoid direction valve (15) can switch the setting shut-off pressure of the pilot valve (2) either from P to A or P to T.



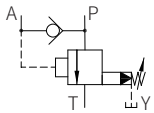
Model G-DAW20-1-5XJ/

Functional symbols

Model DA...-5XJ/...

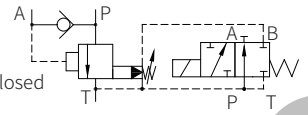


Model DA...-5XJ/...Y...



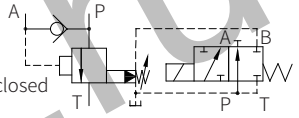
Model DAW...A...-5XJ/...

Normally closed



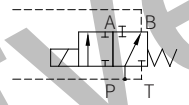
Model DAW...A...-5XJ/...Y...

Normally closed



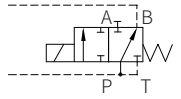
Model DAW...B...-5XJ/...

Normally open



Model DAW...B...-5XJ/...Y

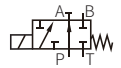
Normally open



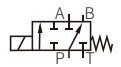
Models and specifications

DA | | | | - 5X | | | | | | | | | | *

- explosion-proof class I =G1
- explosion-proof class II =G2
- with directional valve =W
- pilot valve =No code
- pilot valve without main spool insert (no mark for size) =C
- pilot valve with main spool insert (mark with size 30) =C
- size 10 =10
- size 25 =20
- size 32 =30



normally closed =A



normally open =B

- adjusting element
  - rotary knob =1
  - hexagon screw with sleeve and protective cap =2
  - lockable rotary knob with scale =3
  - rotary knob with scale =7
- 50 to 59 series =5X (50 to 59 series installation and connection size unchanged)
- switching pressure differential (P-A)
  - 10= on average 10 %
  - 17= on average 17 %
- pressure range
  - 50= pressure setting up to 50 bar
  - 100= pressure setting up to 100 bar
  - 200= pressure setting up to 200 bar
  - 315= pressure setting up to 315 bar
- pilot control oil drain
  - No code= pilot control oil drain internal
  - Y= pilot control oil drain external
- C= with directional valve
- G24= DC 24V
- B36= AC rectified 36V
- B127= AC rectified 127V
- B220= AC rectified 220V
- N9= with hidden manual emergency operation
- sealing material
  - No code= NBR seals
  - V= FKM seals (consult for other seals)
- * more information in text

Note:

G1 explosion-proof grade EXD I

G2 explosion-proof grade EXD II CT4

Technical parameters

Hydraulic					
Maximum working pressure	port P	bar	315		
	port A	bar	315(after switching from P to T)		
Hydraulic oil			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]		
Oil temperature range		°C	-30 to +80 (NBR seal)		
		°C	-20 to +80 (FKM seal)		
Viscosity range		mm^2/s	10 to 800		
Maximum flow	Type 10%	L/min	40	80	120
	Type 17%	L/min	60	120	240
Cleanliness of oil[3]			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15		
Maximum setting pressure			50; 100; 200; 315		

1) For NBR seal and FKM seal.

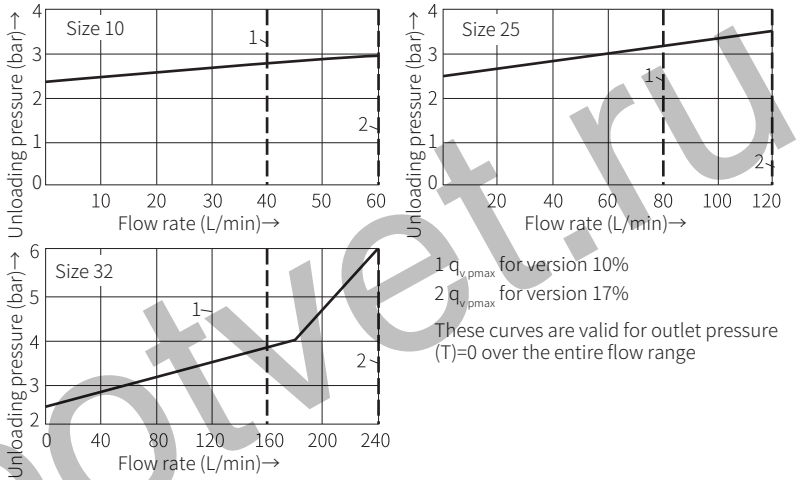
2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

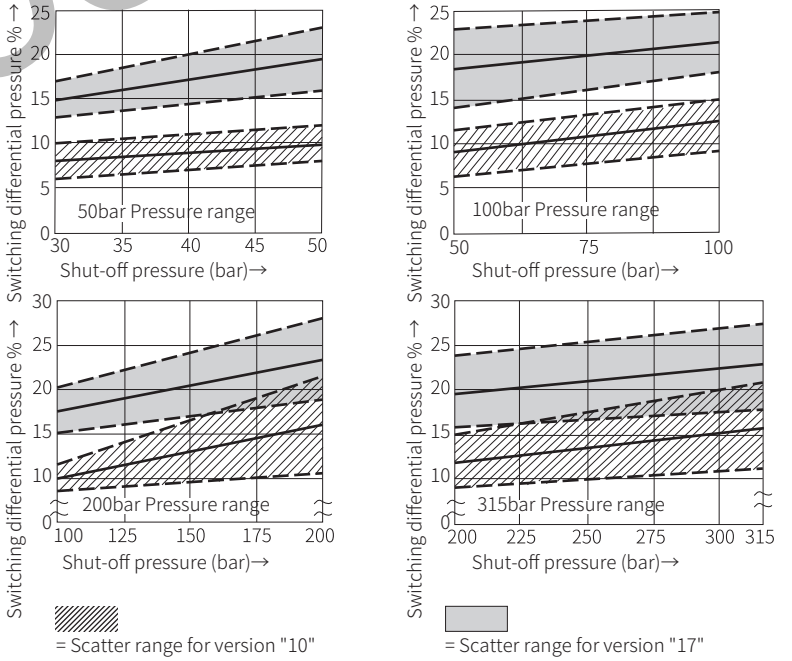
Unloading pressure (P→T)



1 $q_{v\,pmax}$ for version 10%
2 $q_{v\,pmax}$ for version 17%

These curves are valid for outlet pressure (T)=0 over the entire flow range

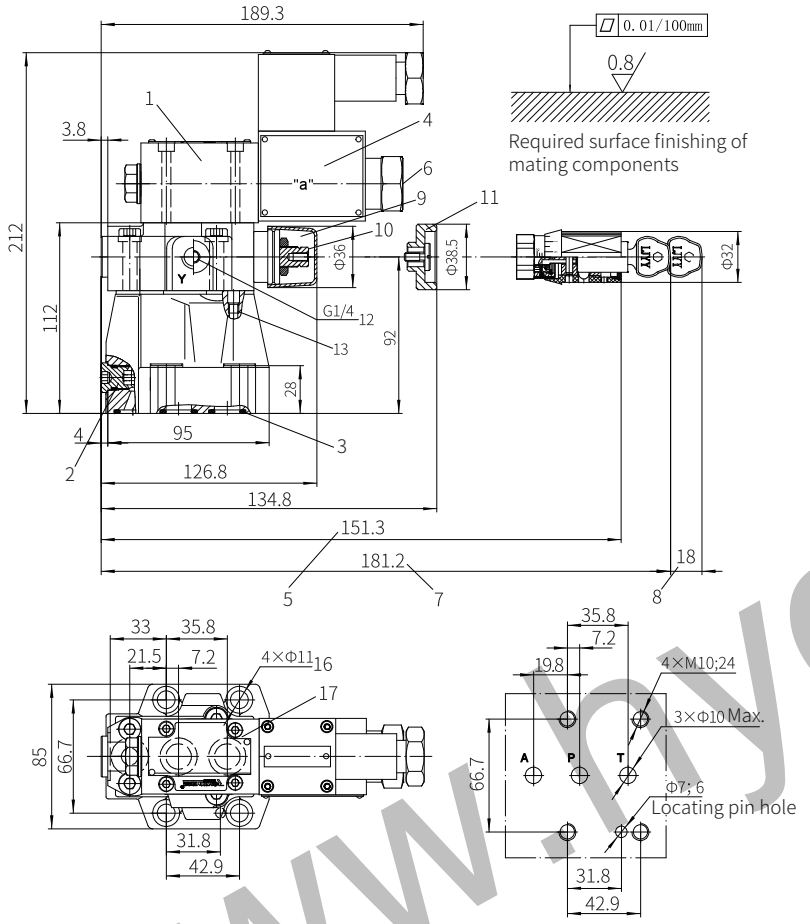
Switching differential pressure in relation to shut-off pressure (P→A)



= Scatter range for version "10"

= Scatter range for version "17"

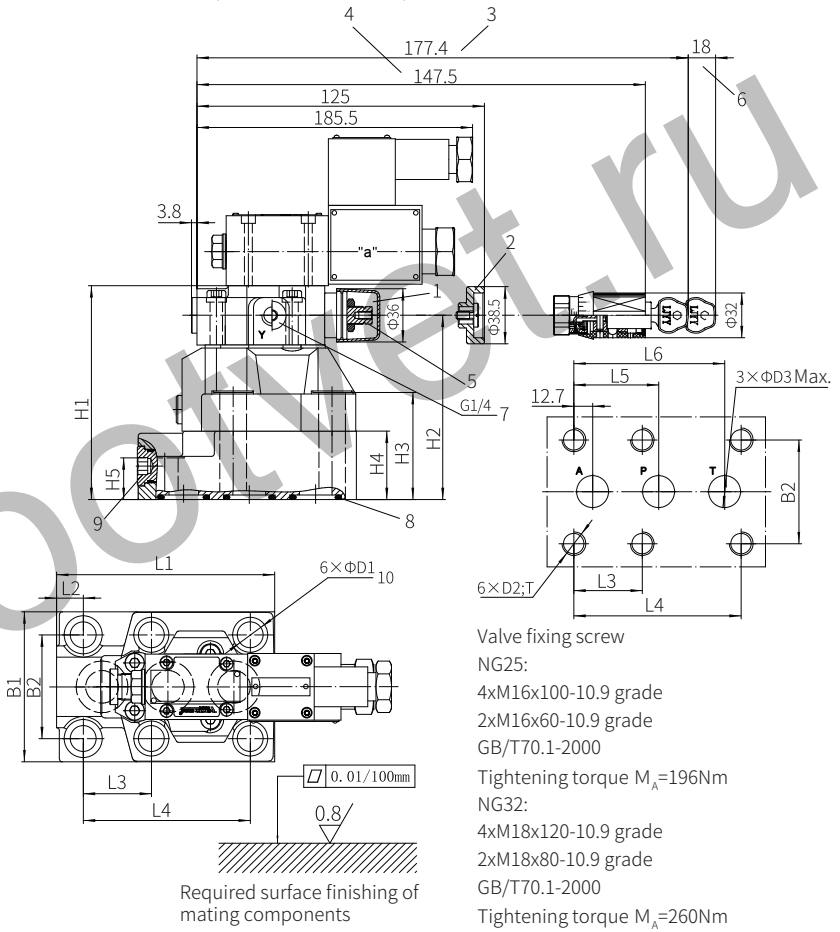
Model G-DAW10...-5XJ/...



Valve fixing screw
M10x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=75Nm
It must be ordered separately if connection subplate is needed.
G467/01; G467/02
G468/01; G468/02

1 Solenoid pilot valve
2 Built-in check valve
3 O ring 17.12x2.62
4 Solenoid
5 Adjustment form“7”
6 Hidden emergency operation
7 Adjustment form “5”
8 Space required to remove the key
9 Adjustment form “2”
10 Hexagon S=10
11 Adjustment form "1"
12 Port Y for control oil drain external
13 Omitted with internal pilot oil drain

Model G-DAW20...-5XJ/...and G-DAW30...-5XJ/...



Valve fixing screw
NG25:
4xM16x100-10.9 grade
2xM16x60-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm
NG32:
4xM18x120-10.9 grade
2xM18x80-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

Size	L1	L2	L3	L4	L5	L6	H1	H2	H3
25	147	18	46	112.7	57.1	101.6	144	124	72
32	189.2	32	50.8	139.7	63.5	127	165	145	93

Size	H4	H5	B1	B2	D1	D2	D3	T
25	46	28	101	69.9	18	M16	22	34
32	67	45	116	82.5	20	M18	30	37

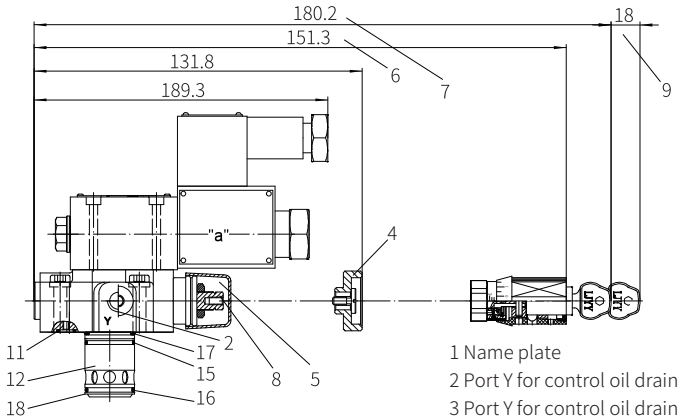
It must be ordered separately if connection subplate is needed.
Subplate model:
NG25: G469/01; G469/02; G470/01; G470/02
NG32: G471/01; G471/02; G472/01; G472/02

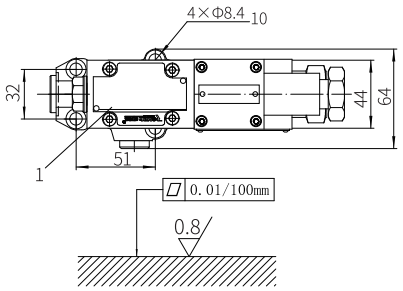
1 Adjustment form “1”
2 Adjustment form “2”
3 Adjustment form “5”
4 Adjustment form “7”
5 Hexagon S=10
6 Space required to remove the key
7 Port Y for control oil drain external
8 O ring
9 Built-in check valve
10 Valve fixing screw hole

Component size

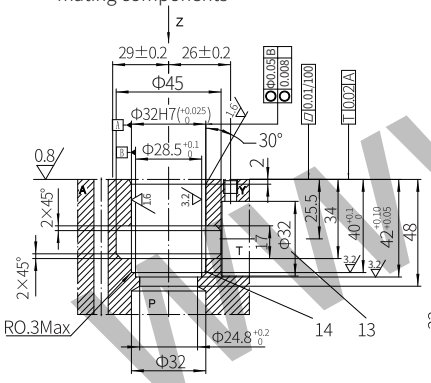
Size unit: mm

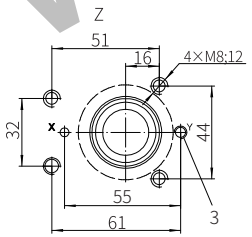
With (G-DAWC10 or 30) or without (G-DAWC)





Required surface finishing of mating components



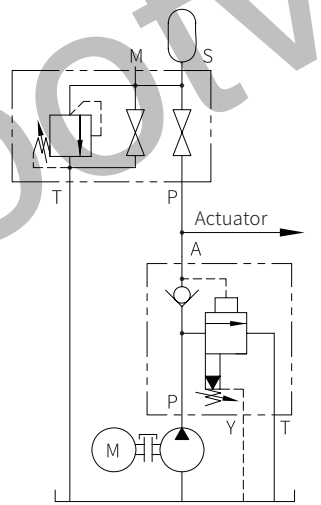


1 Name plate
2 Port Y for control oil drain external
3 Port Y for control oil drain external
(G1/4 or M14x1.5 optional)
4 Adjustment form “1”
5 Adjustment form “2”
6 Adjustment form “5”
7 Adjustment form “7”
8 Hexagon S=10
9 Space required to remove the key
10 Valve fixing screw hole
11 O ring 9.25x1.78
12 Main valve insert
13 The ∅32 hole can intersect ∅45 hole at any position
Be careful not to damage oil port X and fixing holes
14 The retainer ring and O-ring should be installed in this hole before installing main spool.
15 O ring 28x1.8
16 O ring 28x2.65
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8

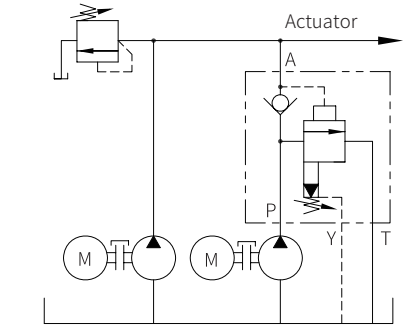
Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

Application example

Hydraulic system with accumulator:
installation notes:
- The connection resistance between DA valve and accumulator must be as low as possible
The pilot valve of DA is separately connected to the accumulator when the resistance is high.



Hydraulic system with high and low pressure pump:
With high pump flow and small switching pressure differential values (10 %), "Y" version valves should preferably be used.



High pressure pump Low pressure pump