

Pressure Switches



Diaphragm-type sensor system for neutral fluids

Working pressure range: 10 ... 100 bar
12 ... 160 bar

Piston-type sensor system with soft seal
for neutral self-lubricating fluids

Working pressure range: 15 ... 250 bar
20 ... 350 bar

Catalog Register

D 5, H 19, T 6

Publication 7502591.06.10.96

**OBSELETE
DOCUMENT**
Technical
Reference
Only

Description

Pressure switch for hydraulic oil, lubricating oil,
light fuel oil etc;

Max. viscosity 1000 mm²/s

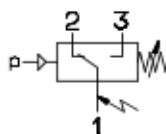
Repeatability: $\pm 2\%$ ¹⁾
Electrical connection: Connector to DIN 43650
Switching element: Microswitch
Degree of protection: IP 65
Ambient temperature: -20 to +80 °C
Fluid temperature: -20 to +80 °C
Temperature at
switching element: +80 °C max.
Mounting position: Optional
vibrations: 15 g max.



Type 19 D

Features

- Leakage-oil-free
- Factory adjusted scale with high accuracy
- Mechanical life 10 million switching cycles
- Microswitch with UL and CSA approval
- Gold-plated contacts in microswitch
- Flanged connection (basic design)
- Intermediate plates for hydraulic directional control valves, sizes 6 and 10



Switching function:
Microswitch SPDT

Terminals 1 – 3: Contacts close on rising pressure

Terminals 1 – 2: Contacts open on rising pressure

Parameters (Switches with switching pressure difference)

Adjustable- range	Switching pressure difference appr. ¹⁾		Max. allowable pressure ²⁾	Switching cycles per minute	Housing material	Pressure sensor materials		Type of connec- tion	Dimen- sional drawing No.	Cat. No.
	lower range [bar]	upper range [bar]				Seal	Other parts			
p ₁ min ... p ₂ max (VDI 3283) [bar]										
10 ... 100	8	16	250	100	Die cast zinc	NBR	1.4104	P	01	0871200
10 ... 100	8	16	250	100		NBR	1.4104		02	0871210⁴⁾
12 ... 160	8	16	250	100		NBR	1.4104		01	0871300
12 ... 160	8	16	250	100		NBR	1.4104		02	0871310⁴⁾
15 ... 250	7	20	500	100		PU	1.4034		03	0870400
15 ... 250	7	20	500	100		PU	1.4034		04	0870410⁴⁾
20 ... 350	6	25	500	100		POM	2.0401		03	0870500
20 ... 350	6	25	500	100		POM	2.0401		04	0870510⁴⁾
						NBR	2.2141			

NBR- Perbunan
PU- Polyurethane
POM- Delrin

P- Flanged

¹⁾ Referred to pressure control at constant fluid and ambient conditions.

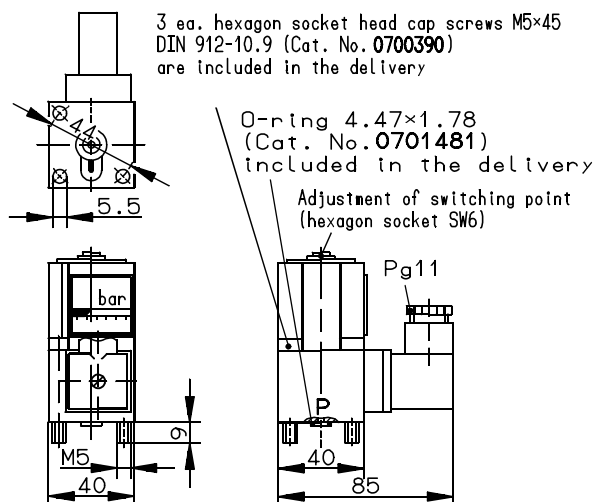
²⁾ Operating data based on 3.5 million switching cycles.

³⁾ Even short pressure peaks during operation must not exceed this max. allowable value which is equivalent to the max. test pressure.

⁴⁾ Lockable design

Dimensional drawing

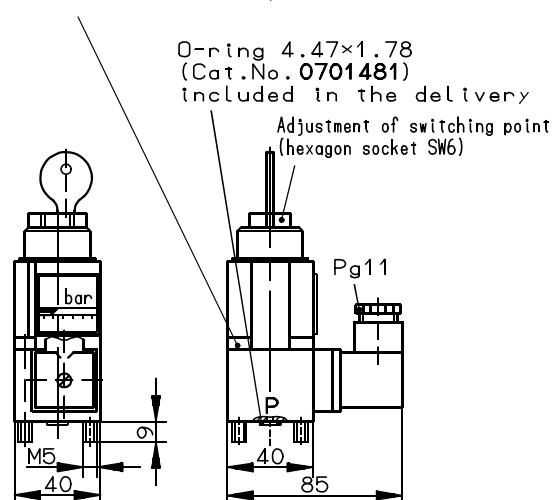
01



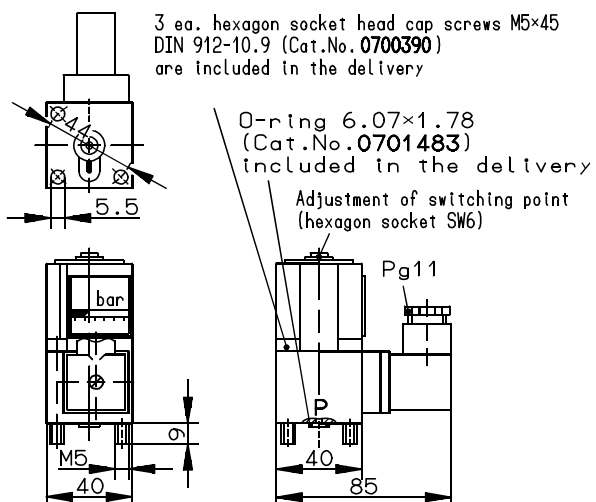
Lockable design

02

3 ea. hexagon socket head cap screws M5×45
DIN 912-10.9 (Cat.No. **0700390**)
are included in the delivery

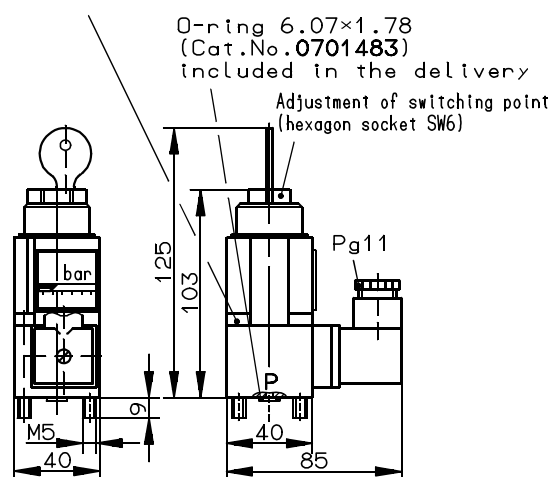


03



04

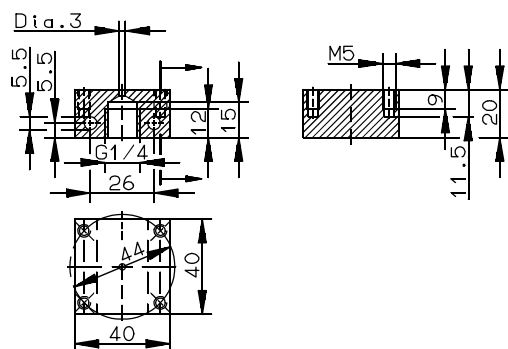
3 ea. hexagon socket head cap screws M5×45
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Accessories

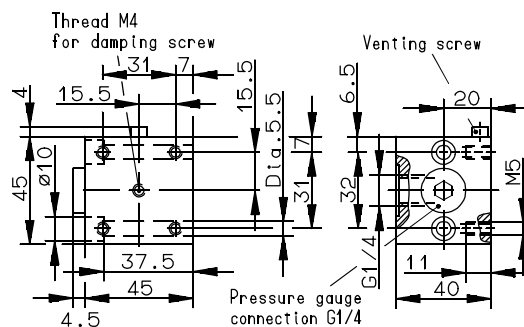
Subplate G 1/4

Order No. 0520626



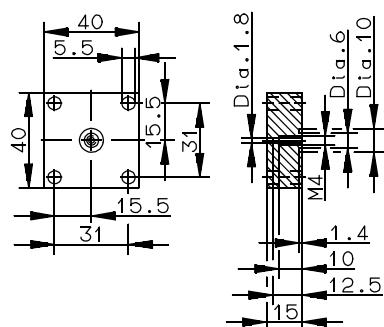
Subplate G 1/4

Order No. 2840115



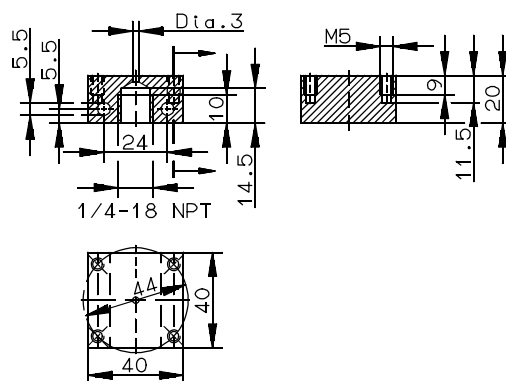
Subplate with damping device

Order No. 0520861



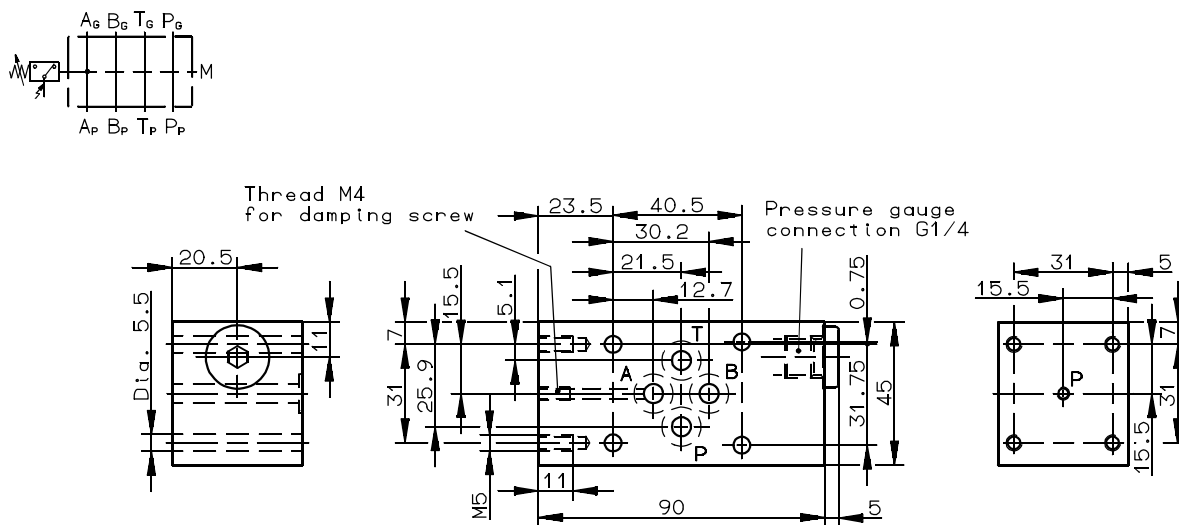
Subplate G 1/4 NPT

Order No. 0520913

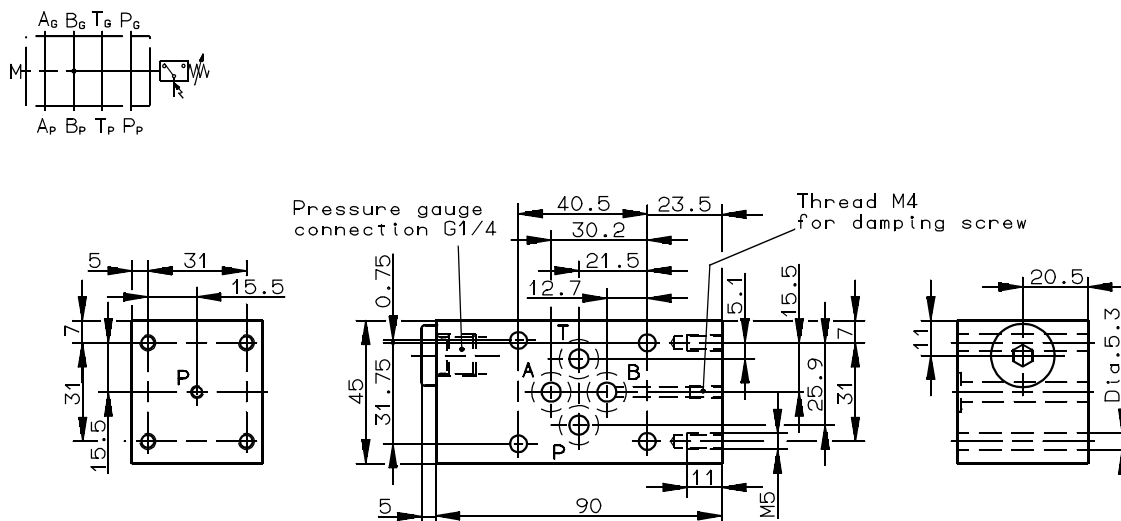


Accessories. Intermediate plates for hydraulic directional control valves, size 6, for connection of **pressure switch 19 D** and **pressure switch, G 1/4**

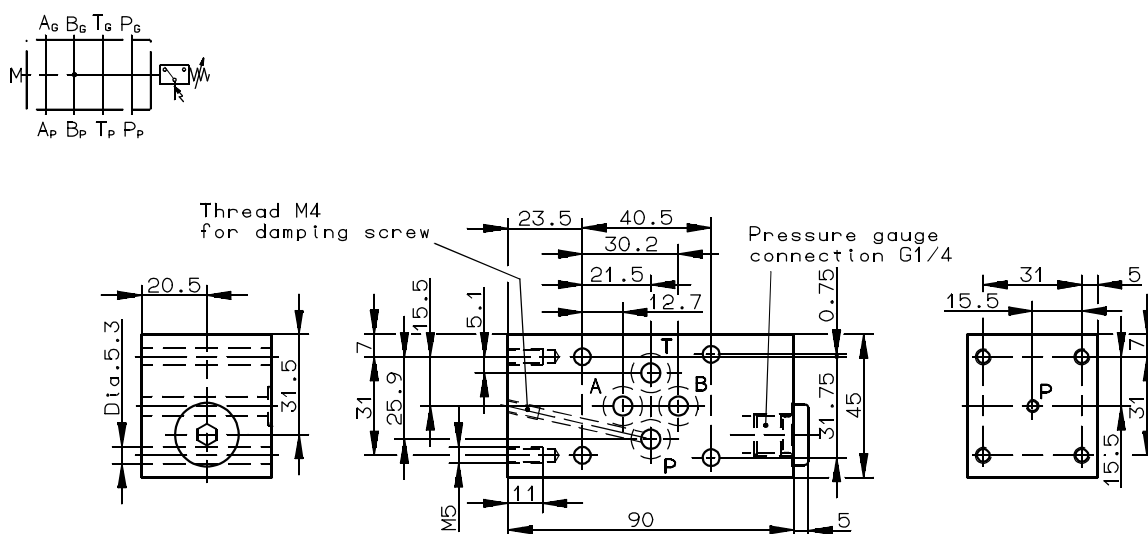
Pressure switch in port "A" Cat. No. 2840116



Pressure switch in port "B" Cat. No. 2840117

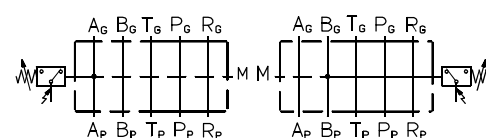


Pressure switch in port "P" Cat. No. 2840118

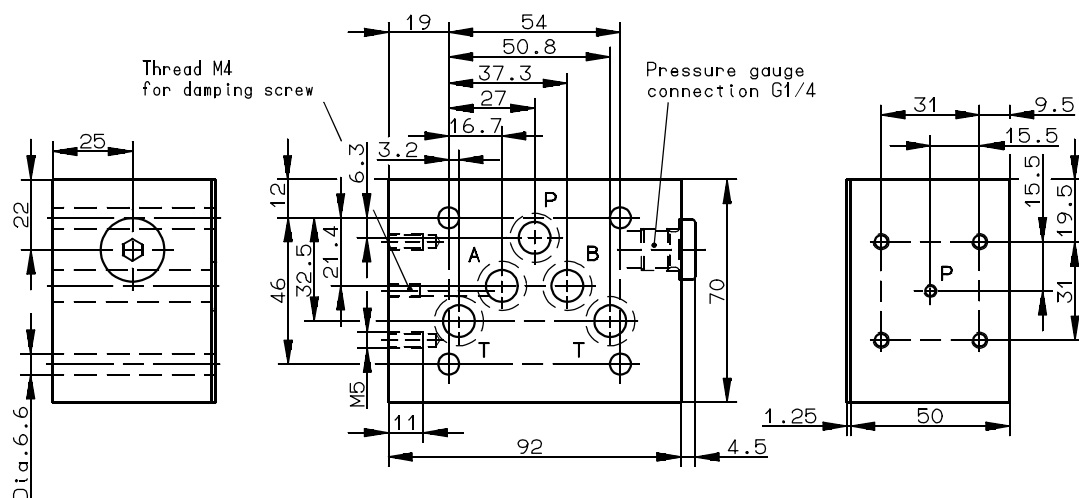


Accessories Intermediate plates for hydraulic directional control valves, size 10, for connection of **pressure switch 19 D** and **pressure gauge, G 1/4**

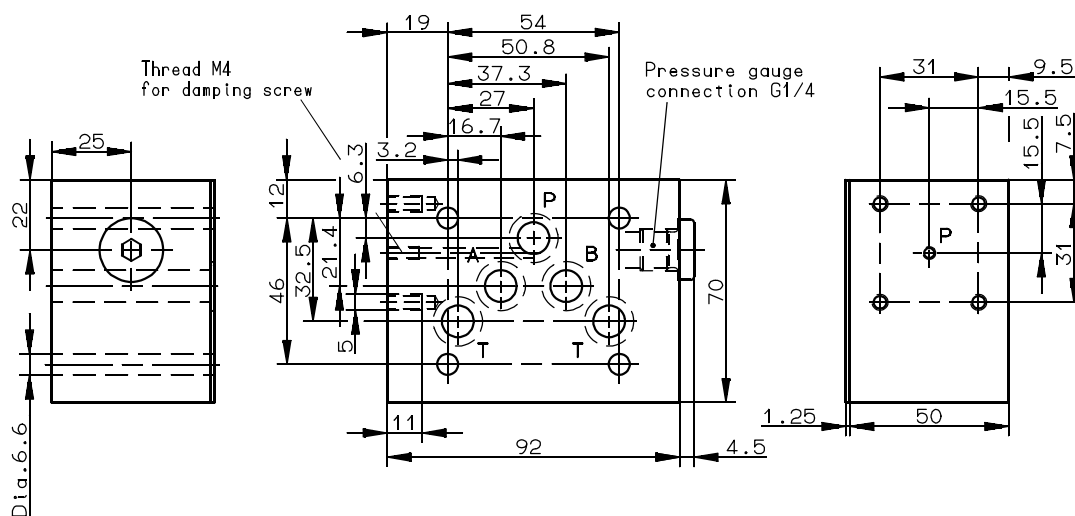
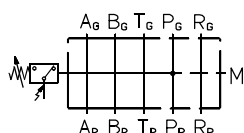
Pressure switch in A



Pressure switch in connection "A" or "B"



Pressure switch in port "P", Cat. No. 2840120



Mounting material for intermediate plates, size 6

Designation	Effective length [mm]	Cat. No.
Socket head cap screw	62	0662315
Socket head cap screw	102	0661664
Stud bolt	142	0727358
Stud bolt	182	0721154
Stud bolt	203	0720701
Stud bolt	234	0725517
Stud bolt	274	0725519
Stud bolt	243	0727359
Nut M 5	—	0750653

Mounting material for intermediate plates, size 10

Designation	Effective length [mm]	Cat. No.
Socket head cap screw	100	0659221
Stud bolt	150	0722090
Stud bolt	200	0721156
Stud bolt	225	0724260
Stud bolt	251	0725521
Stud bolt	282	0725522
Stud bolt	307	0725523
Nut M 6	—	0750654

Accessories

Connectors (black) with light indicator

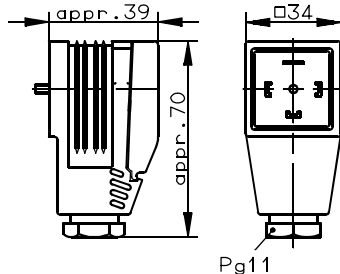
3-pole + protective conductor, connection to DIN 43650 A,

Optionally available for DC or AC

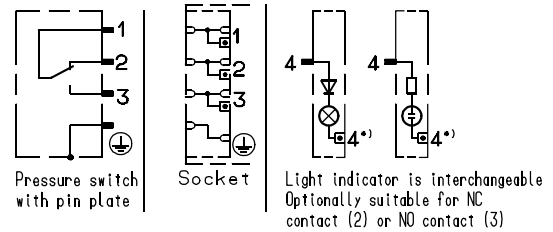
-with filament lamp 12 to 28 V Cat. No. **0585418**

-with glow lamp 90 to 130 V Cat. No. **0585419**

-with glow lamp 180 to 240 V Cat. No. **0585420**



The light indicator shows the switching position of the connected pressure switch.



*) For contact (4) a special lead (Mp resp.-) is required

Switch selection

The switching points should normally be in about the middle of the adjustable range.

Electrical ratings must not be exceeded.

Electrical connection in accordance with local regulations. For outdoor installation sufficient protection has to be provided for. Critical conditions are: Aggressive atmosphere, drastic changes in temperature, solar radiation, saline atmosphere.

For liquid fluids with pressure peaks and/or pulsating pressure, an M 4 x 8 DIN 551 damping screw is to be screwed into the subplate. (Damping via backlash of threads).

Max. dia. of pressure port in counterflange is 3 mm.

Set point adjustment

1. Adjust switching points by means of a 6 mm hexagon spanner.

Clockwise turn:

Switching point moves upwards Counterclockwise turn: Switching point moves downwards.

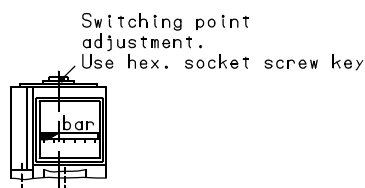
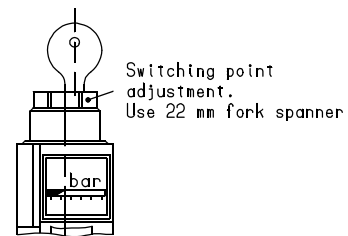
2. Scale readings refer to switching points with pressure rising. The pressure difference determines the respective switch back point.

3. The switching points may be adjusted even during operation.

Lockable design:

Same as basic design, however with the following difference:

1. Insert key and turn it 90° in order to engage the freely rotating adjusting ring.
2. Adjust switching point by means of a 22 mm fork spanner.



Making and/or breaking capacity

Change-over switch with gold-plated contacts

Load level	Type of current	Type of load	U _{min} [V]	Max. permanent current I _{max} [A] at U [V]					Contact life ³⁾	
				30	48	60	125	250	electrical at I _{max}	mechanical at I ≈ 0
Standard ¹⁾ (e.g. contactors solenoids)	AC	Resistive load	12	5	5	5	5	5	5 × 10 ⁴ switching cycles	≥ 10 ⁷ switching cycles
	AC	Inductive load, cos φ ≈ 0.7	12	3	3	3	3	3		
	DC	Resistive load	12	5	1.2	0.8	0.4	—		
	DC	Inductive load, L/R ≈ 10 ms	12	3	0.5	0.35	0.05	—		
Low ²⁾ (e.g. electronic circuits)	AC	Resistive load	5 ⁴⁾	0.34	0.2	0.17	0.08	0.04	2 × 10 ⁵ switching cycles	≥ 10 ⁷ switching cycles
	DC	Inductive load, L/R ≈ 10 ms	5 ⁴⁾	0.1	0.01	—	—	—		

Reference number of switchings: 30/min,
Reference temperature: +30°C

Spark quenching with diode
with DC and inductive load: $I_{\max} = 1.5 \times I_{\max}$ of table
 $I_{\min} = 1$ [mA]

Creepage- and air paths correspond to insulation group B according to VDE Reg. 0110 (except contact clearance of microswitch).

Spark quenching (direct current):

1. Diode in parallel with inductive load
Make sure polarity is correct when making connections..

Dimensioning of quenching diode (rectifier):

Rated voltage of diode $U_D \geq 1.4 \times V_{\text{Term.}}$

Rated current of diode $I_{\text{Rated}} \geq I_{\text{Load}}$

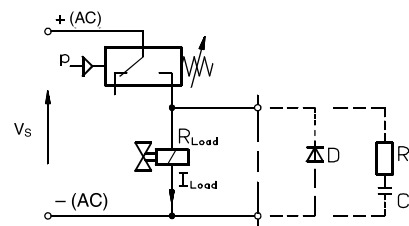
Choose quick switching diode (recovery time $t_{\text{rr}} \leq 200$ ns).

2. RC-link in parallel with load (or in parallel to switching contact).
Suited for direct and alternating current.

Ratings:

$$R [\Omega] \approx 0.2 \times R_{\text{Load}} [\Omega]$$

$$C [\mu\text{F}] \approx I_{\text{Load}} [\text{A}]$$



¹⁾ Gold-plating not required as it would decay. Max. perm. inrush current (appr. 30 ms) $AC_{\text{make}} = \text{max. } 15 \text{ A}$.

²⁾ Gold-plating required (will not decay).

³⁾ 50 % of the respective switching current I nearly doubles contact life.

⁴⁾ Lower value of critical voltage guarantees sufficient contact safety. Lower voltages permissible under favourable conditions.