

ED Type Series Relief Valve (for Pump Relief)

for (Pump), (Thermal Relief) etc. **【 DAMPER TYPE 】**

ED Type series pump relief valves are pressure regulating relief valves specially designed for pumps. With damper mechanism, they can perform pressure detection reliably, and therefore can also be used with displacement pumps such as plunger pump. Also, since these valves have a structure that can balance back pressure, they can not be affected by back pressure and are ideal products for thermal relief.



SL-46ED Type

■ FEATURES

- Damper component ensures that valve disc remains steady even when pressure is high and changes rapidly.
- Back pressure balancing structure makes the valve free from influence of back pressure that may occur due to outlet piping of relief valve.

Max. 2.0MPa

■ SPECIFICATIONS

Model name		SL-46ED	SL-6ED
Code name		SL46ED-M□	SL6ED-C□
		※ Code No. of pressure division is required in □. (Refer to Page 76)	
Applicable fluid		Water, oil & liquids	
Size		40~75(1½"~3")	
Fluid temperature		5~80°C(Available up to 150°C upon request*1.)	
Set pressure range		0.035~2.0MPa	
Maximum allowed back pressure		1.0MPa	
End connection		Flanged JIS 20KFF*2	
Materials	Body	Ductile cast iron	Cast steel*3
	Trim	Stainless steel	
Valve body pressure test		1.5 times of rated pressure (Hydraulic)	2 times of rated pressure (Hydraulic)

*1. The temperature should be Max. 150°C for oil and Max. 90°C for hot water.

*2. Flanged JIS 10, 16K are available upon your request.

*3. Products with stainless steel main body are available.

■ DIMENSIONS

Size	L ₁	L ₂	H	Mass(kg)
40(1½")	110	100	251	13.3
50(2")	120	110	296	22.5
65(2½")	130	120	365	27.1
75(3")*	145	135	403	36.6

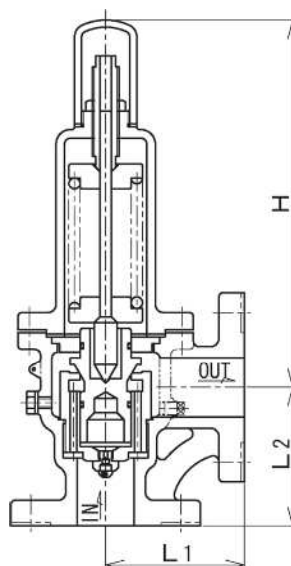
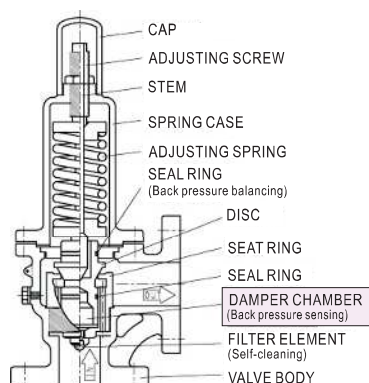
Note: The weight data is for SL-6ED (with cast steel main body).

※ The nominal diameter of flange is that of JIS flange (80mm).

Flange code JIS 20KFF

■ CONSTRUCTION

■ DAMPER CONSTRUCTION



DATA/E, ED Type Series Relief Valve (for Pump Relief)

PRESSURE DIVISION TABLE

● E TYPE SERIES RELIEF VALVE

【DASH POT TYPE】 for PUMP

SL-38E, 40E TYPES (Screwed Type)

(MPa)

Code No.	SL38E-D□, SL40E-D□
1	0.035~0.2
2	Over 0.2~0.5
3	Over 0.5~1.0
4	Over 1.0~1.6

* Code No. of pressure division is required in □.

SL-40EF TYPE (Flange Type)

(MPa)

Code No.	SL40EF-D□
1	0.035~0.2
2	Over 0.2~0.5
3	Over 0.5~1.0

* Code No. of pressure division is required in □.

SL-44E TYPE (Flange Type)

(MPa)

Code No.	SL44E-G□ Size 15~50mm
1	0.035~0.2
2	Over 0.2~0.5
3	Over 0.5~1.0

* Code No. of pressure division is required in □.

SL-24E TYPE (Flange Type)

(MPa)

Code No.	SL24E-B□, SL24E-G□	
	Size 65mm	Size 80mm
1	0.035~0.2	0.035~0.2
2	Over 0.2~0.7	Over 0.2~0.5
3	Over 0.7~1.0	Over 0.5~0.8
4		Over 0.8~1.0

* Code No. of pressure division is required in □.

● ED TYPE SERIES RELIEF VALVE

【DAMPER TYPE】 for PUMP AND THERMAL RELIEF PURPOSE

SL-8ED TYPE (Screwed Type)

SL-10ED TYPE (Flange Type)

(Max. 3.0MPa)

■ FORGED STEEL

(MPa)

Code No.	SL8ED-N□, SL10ED-N□		
	Size 15~20mm	Size 25mm	Size 32mm
1	0.035~0.15	0.035~0.3	0.035~0.15
2	Over 0.15~0.4	Over 0.3~0.5	Over 0.15~0.3
3	Over 0.4~0.8	Over 0.5~1.0	Over 0.3~0.6
4	Over 0.8~1.5	Over 1.0~2.0	Over 0.6~1.1
5	Over 1.5~2.5	Over 2.0~3.0	Over 1.1~1.6
6	Over 2.5~3.0		Over 1.6~2.4
7			Over 2.4~3.0

* Code No. of pressure division is required in □.

■ STAINLESS STEEL

(MPa)

Code No.	SL8ED-D□, SL10ED-D□		
	Size 15~20mm	Size 25mm	Size 32mm
1	0.035~0.15	0.035~0.3	0.035~0.15
2	Over 0.15~0.4	Over 0.3~0.45	Over 0.15~0.3
3	Over 0.4~0.8	Over 0.45~1.0	Over 0.3~0.6
4	Over 0.8~1.5	Over 1.0~2.0	Over 0.6~1.0
5	Over 1.5~2.5	Over 2.0~3.0	Over 1.0~1.5
6	Over 2.5~3.0		Over 1.5~2.0
7			Over 2.0~3.0

* Code No. of pressure division is required in □.

SL-46ED TYPE (Flange Type)

SL-6ED TYPE (Flange Type)

(Max. 2.0MPa)

(MPa)

Code No.	SL46ED-M□, SL6ED-C□
1	0.035~0.1
2	Over 0.1~0.2
3	Over 0.2~0.4
4	Over 0.4~0.6
5	Over 0.6~0.85
6	Over 0.85~1.5
7	Over 1.5~2.0

* Code No. of pressure division is required in □.

Fig 1. FLOW CHARACTERISTICS CHART

Applicable models:

SL-38E, SL-40E, SL-40EF
SL-24E, SL-44E
SL-6ED, SL-8ED
SL-10ED, SL-46ED

Flow
kg/h

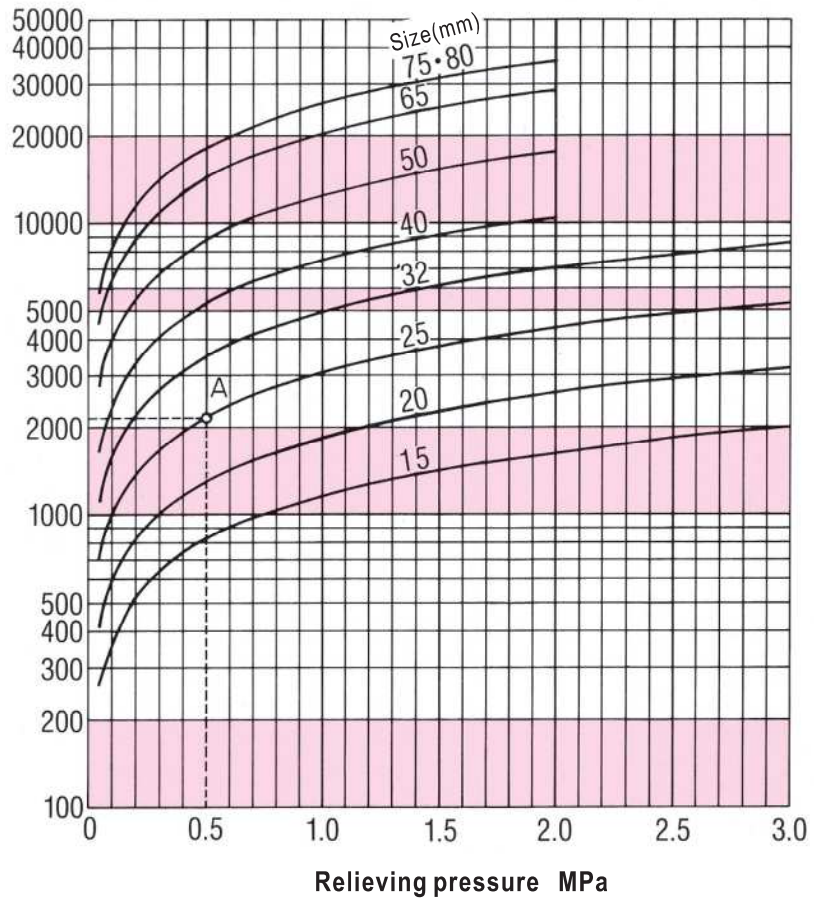
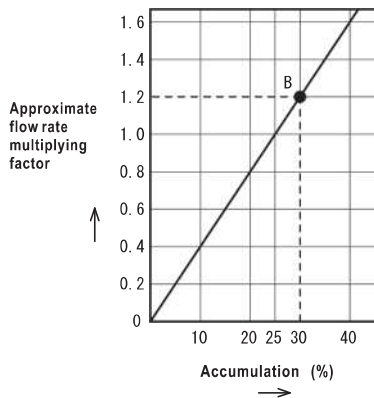


Fig 2. APPROXIMATE FLOW RATE



● HOW TO USE THE CHART

1. Use Fig.1 when accumulation is 25%.
2. Use Fig.1 and Fig.2 when accumulation is not 25%.

● EXAMPLE

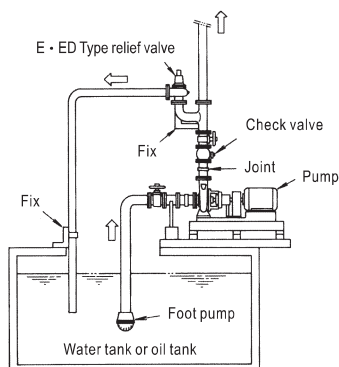
1. Conditions: size 25mm, relieving pressure 0.5MPa, accumulation 25%. From point A (the point where 0.5MPa relieving pressure line intersects with size 25mm curve) in Fig.1, the flow will be 2,180kg/h.
2. When accumulation is 30% and other conditions are the same as above, since the approximate flow rate multiplying factor is 1.2, which can be acquired using point B in Fig.2, the flow will be $2,180 \times 1.2 = 2,616 \text{ kg/h}$.

● kg/h→L/min conversion (for reference only)

Since the weight of 1L water is about 1kg

$$L/min = \frac{\text{value in the above chart (kg/h=L/h)}}{60}$$

■ PIPING EXAMPLE



Key Points for Installation of Safety Valves and Relief Valves

1. Installation

- ❶ Safety valve should be vertical to pipe. Before installation, remove scale and dust and clean the surfaces that contact with gasket.
- ❷ The diameter of the installation pipe should be larger than the diameter of valve. To reduce pressure loss to minimum degree, the stand pipe should be as short as possible.
- ❸ The stand pipe should be rigid and hard enough to bear the compression force, shearing force, bending stress or other counterforce caused by relieving of safety valve.
- ❹ Compared with the diameter of the outlet of safety valve, the diameter of the discharge pipe should be as large as possible. The discharge pipe should be as short as possible, without any bending, lead to outside of the door or other safe place, and be properly supported to avoid the occurrence of undesired stress (including thermal stress).

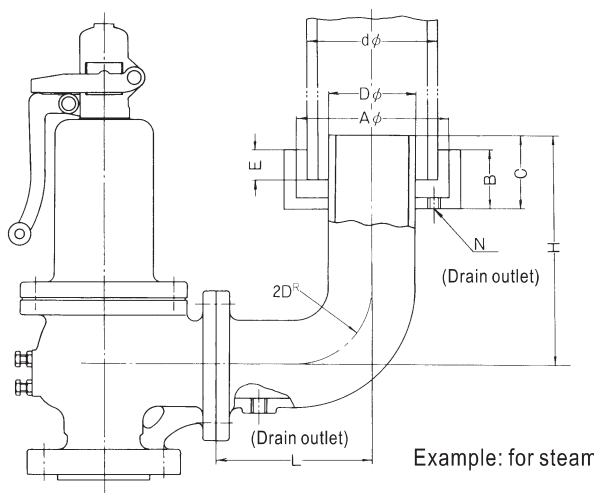
When deciding the place that the outlet of the discharge pipe faces, pay attention to the following issues.

- To avoid installation place where is influenced by explosive sound and blast.
- Avoid damage to electrical equipments, machines, tools etc. in the case the fluid is steam or water.
- Avoid corrosion, poisoning, anoxia etc. in the case the fluid is harmful gas.

- ❺ In the case of screwed type safety valve or relief valve, install union joint at the discharge pipe of the outlet side to allow easy dismounting (see Fig.1 in next page).
- ❻ At parts of the discharge pipe where drain or rain may accumulate, install the drain outlet, which is possible to discharge drain completely, and connect to dike.
- ❼ In the case of full bore type safety valve for liquids or harmful gases and have faucet for adjusting back pressure, install the valve on the outlet discharge pipe (see Fig.3 in next page).

- ❽ To avoid adverse impact on safety valve that is caused by thermal expansion of devices or discharge pipe, install proper expansion joint at the outlet of valve and install a discharge pipe at the end (see the figure below). To limit counterforce, the distance between the axes of the valve and the center of discharge pipe should be as short as possible, and the radius of the elbow pipe should be at least $2D$ (D : the internal diameter of the elbow). below figure also shows the standard dimensions of the discharge pipe of safety valve.

- ❾ Cares should be paid on installation of valves with lever (open type). It may effuse fluid from upper cap when such valves are operating (see Fig.5 in the next page).



REFERENCE DIMENSION FOR EXHAUST PIPE

(mm)

Outlet size	D	d	(A)	B	C	E	L	H	N
40(1½")	40	65	130	60	80	30	130	220	Rc¾"
50(2")	50	80	150	60	90	40	150	230	Rc½"
65(2½")	65	100	200	60	100	40	180	270	Rc½"
80(3")	80	125	200	70	120	50	200	310	Rc½"
100(4")	100	150	250	70	140	60	250	370	Rc¾"
125(5")	125	200	300	80	160	70	300	430	Rc1"
150(6")	150	200	300	80	180	70	350	500	Rc1"
200(8")	200	250	380	100	220	80	450	610	Rc1"

2. Maintenance and operating instructions

- ❶ At the installation of safety valves avoid the place where there is possibility to obstruct their functions by vibration or corrosion and do not give impact from outside.
- ❷ After installation, make sure the pressure of the device has reached at least 75% discharge pressure of the valve before using the test lever to start the valve.
- ❸ Normal working pressure of the equipment shall not exceed 90% of the blowdown pressure of the valve and 80 to 85% when pulsation is expected.

- ❹ If possible, remove safety valve before making water pressure test. To make water pressure test without removing safety valve, pay attention to the following below (see Fig.4 in the next page).
 - Ⓐ To prevent valve from being damaged due to improper load, when the pressure of the device reaches 80~90% of discharge pressure, install test gag* and press lightly on the end of valve shaft. The test gag must be rotated using hand. If you rotate it using

spanner or other tools, there may have excessively large pressing force, the seat may be damaged, the shaft may be bent, and the valve may not function normally.

- Ⓑ After water pressure test and the pressure reduces to 80~90% relieving pressure, remove test gag immediately.

※ The test gag is optional item.

Key Points for Installation of Safety Valves and Relief Valves

PIPING EXAMPLE

Fig.1 Example: Pressure tank installation

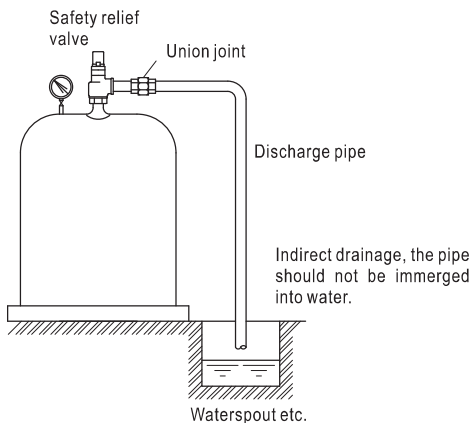


Fig.2 Example: Installation of the secondary side of pressure reducing valve

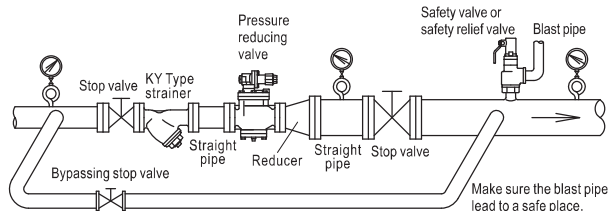


Fig.3 Example connection of back pressure adjusting cock

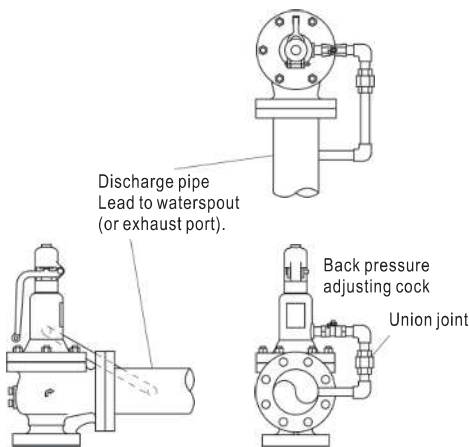


Fig.4 Installation of test gag

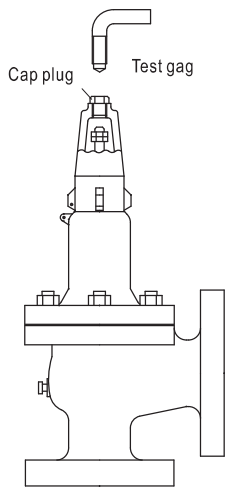


Fig.5 Lever structure

Lever structure of SL-37, 39, 39F, 43 Type
For air, gas, or liquid

