

Type TDL

Pump protection valve for centrifugal pumps
Compact pump protection - high bypass flow



> Type TDL, front view



> Type TDL, sectional view

Product features

- Automatically modulating bypass function
- Carbon steel or stainless steel
- Special materials possible (e.g. Super Duplex)
- Internal operation (no external energy source required)
- Easy to install
- Low maintenance
- Suitable for all liquids

Applications

- Boiler feed water
- Condensate
- Chemical processes
- Extinguishing water
- Snow canons

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Technical data

Nominal diameter	DN 25–500 / NPS 1–20
Pressure class	PN 10–160 / Class 150–900
Temperature (max.)	Up to 230 °C / 446 °F (other temperatures on request)
Housing material	1.0460 / A105 1.0571 / LF2 1.4404 / F316L 1.4462 / F51 1.4501 / F55
Housing type	Forged or cast
Media	Liquids of all kinds (water, oils, chemicals and others)
Flanges	EN 1092-1, ASME B16.5, ISO 7005, JIS, JPI, welding ends on request
Designs	Vertical installation, horizontal installation, manual start-up, enlarged nominal width of the bypass, degassing connection
Number of stages (max.)	1
Number of controlled stages (max.)	1
Operating range (max.)	Delta p up to max. 40 bar
Other	Bypass differential pressure up to 40 bar

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Function

The outlet main flow controls the non-return valve and positions it in proportion to the flow. The stem of the non-return valve transmits the motion via a lever to the bypass. The bypass system regulates the bypass flow in a modulating way and reduces the pressure to the bypass outlet pressure level without cavitation.

When the non-return valve is completely closed, the entire minimum flow is routed through the bypass. The bypass is fully closed when the non-return valve is in its upper position, thereby allowing full pump flow to the system.

Flow sensitive modulating bypass control

The non-return valve moves upwards with increasing main flow and downwards with decreasing flow. The non-return valve transmits this movement to the control lever.

The movement of the control lever is transferred to the control bushing. This opens the control holes in the control head by a greater or lesser degree. The opening characteristic is linear. Applicable for differential pressures up to 40 bar. Standard with non-return function.

Manual bypass options for TDL valves

Depending on the plant design or additional requirements, various options can be selected for the start-up / warm-up side (A) and for the bypass side (B).

Option A:

One frequently used option is to feed low pressure flow to the process / boiler via the manual start-up. Either for the warm-up process or for heating the adjacent pumps/systems.

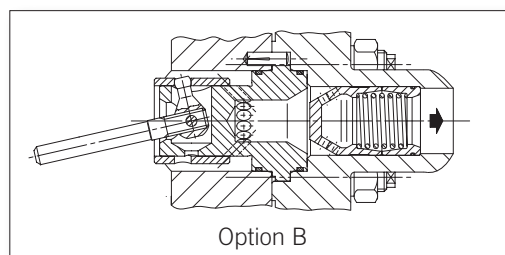
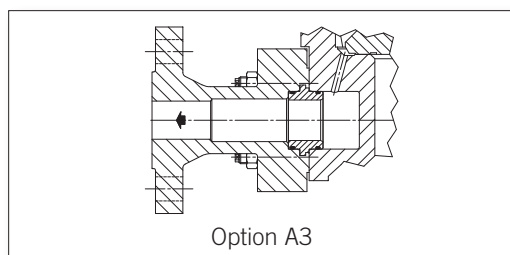
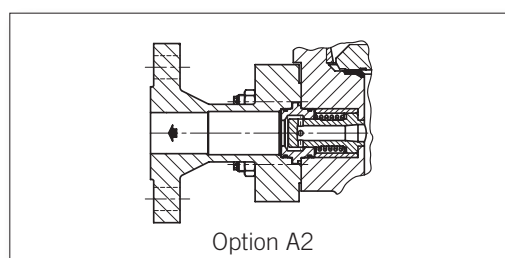
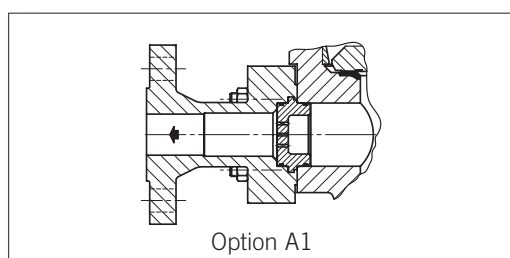
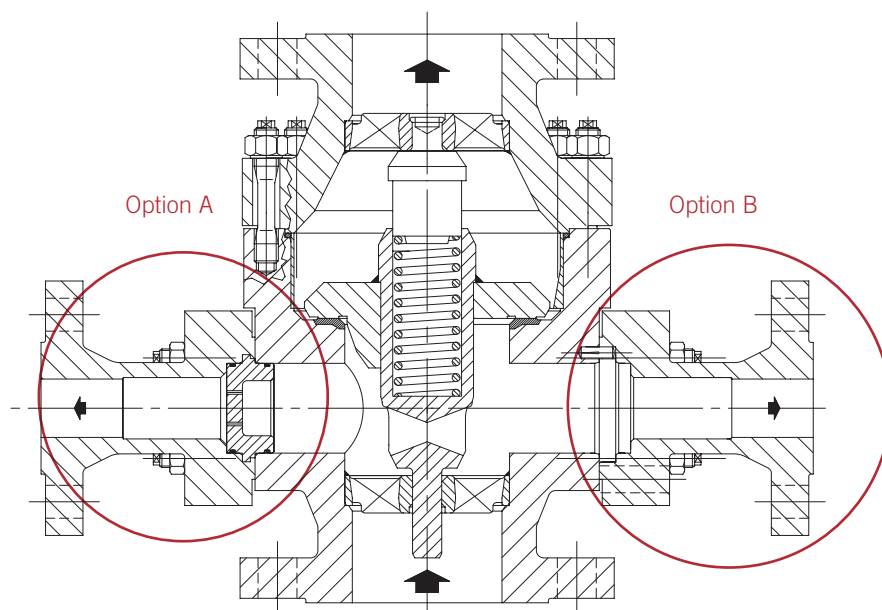
Option B:

Depending on the operating conditions of the system (dirt, certain load cases, etc.), special internal parts can be selected for the bypass. The valve is then supplied with the integrated optional bypass set. In this case the original internal parts for the bypass are supplied and installed after commissioning.

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Option A1 - Start-up/heating connection under the non-return valve plug

Option A2 - Degassing system

Option A3 - Start-up/heating connection above the non-return valve plug

Option B - Commissioning the internal parts for the TDL valve
(for commissioning with enlarged clearances)

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Installation information

The TDL valve should be installed as close as possible to the discharge port of the centrifugal pump, preferably directly on the pump discharge port of the pump.

To avoid frequency interference due to pressure oscillations in the medium, the distance between the pump outlet and the valve inlet should not exceed 3 m. Take care to ensure a straight inlet section. Exceptions have to be confirmed to SCHROEDAHL.

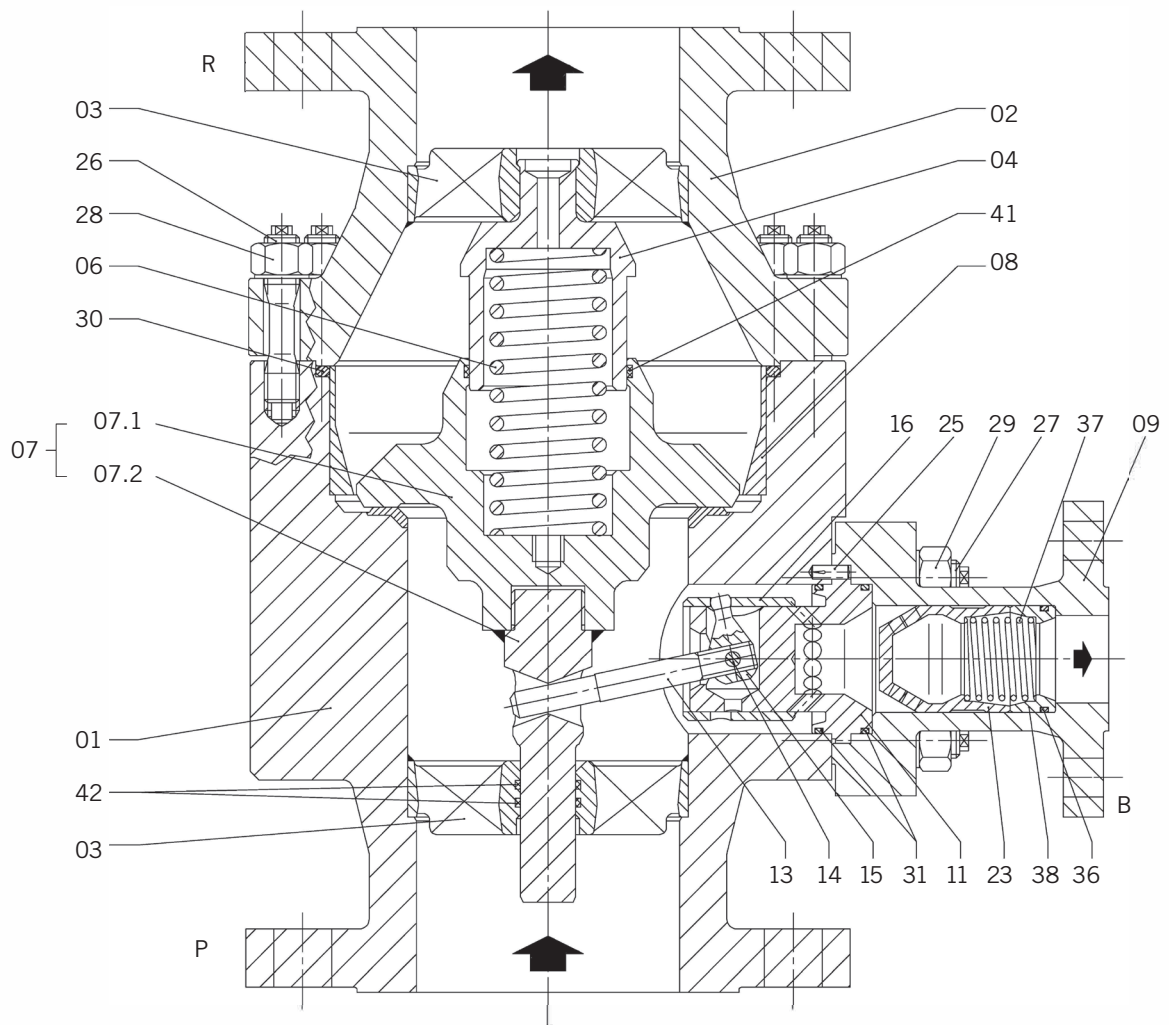
Vertical installation is preferred, but horizontal installation is also possible upon request. TDL valves operate at a low noise level and ensure a high reliability due to their sturdy design.

The recommended filter at the pump inlet should have a mesh size of 0.3 to 0.5 mm. A smaller mesh size of 0.1 mm is recommended for commissioning.

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Sectional drawing (housing)



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Parts list (housing)

Pos.	Item	Material
01	Lower Body	*
02	Upper Body	*
03	Stemguide	1.4408
03.1	Stemguide	1.4408
04	Guide bolt	1.4021
06	Spring	1.4310
07	Check valve cpl.	1.4404
07.1	Check valve	1.4404
07.2	Stem	1.4404
08	Liner or venturi ring	1.4300 o. 1.4301
09	Bypass branch	*
25	Guide pin	A2
26	Bolt	**
27	Bolt	**
28	Hexagon nut	**
29	Hexagon nut	**
30	O-Ring	*
41	Guide ring	PTFE/Carbon
42	Guide ring	PTFE/Carbon

 Recommended spare/wear parts

* Depending on customer requirements

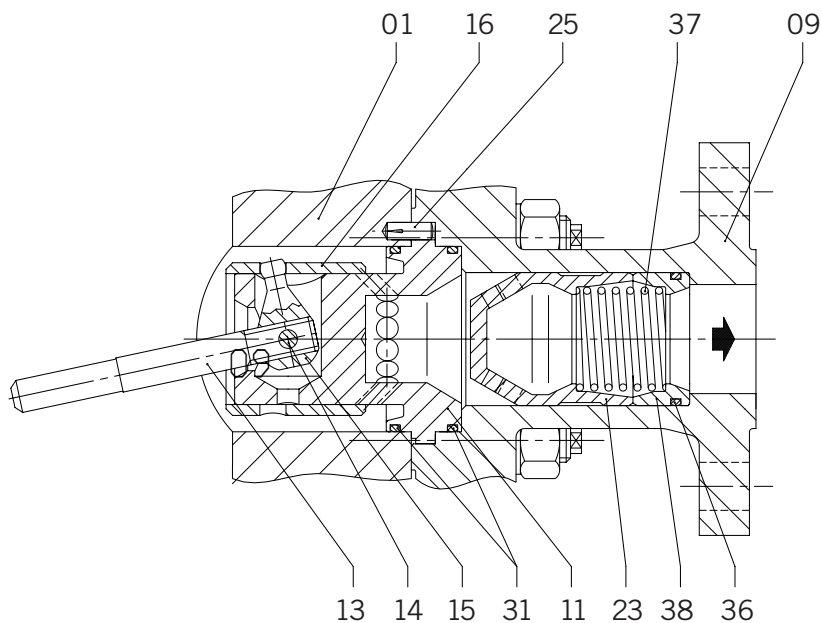
** Depending on size and pressure rating

Parts list as an example of the standard configuration

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Sectional drawing (bypass)



Parts list (bypass)

Pos.	Item	Material
11	Control head	1.4122
13	Lever	1.4021
14	Pivot pin	1.4301
15	Crank arm	1.4122
16	Control bushing	1.4122
23	Orifice bushing	1.4122
31	O-Ring	*
36	O-Ring	*
37	Spring	1.4310
38	Bottom ring	1.4122

 Recommended spare/wear parts

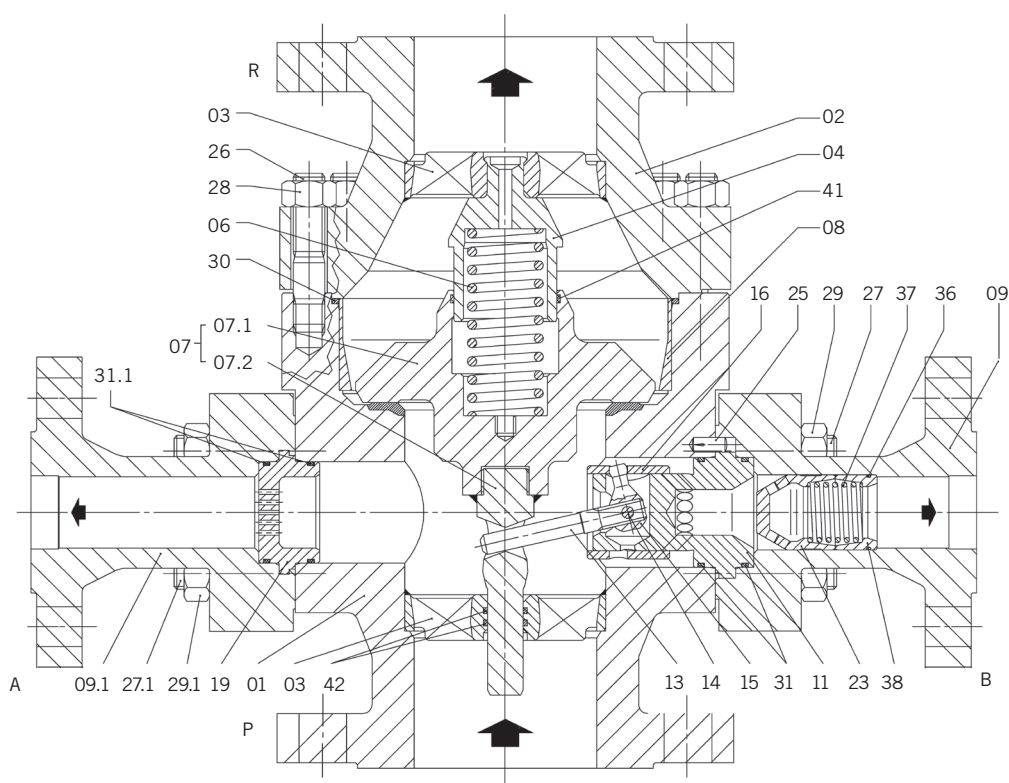
* Depending on customer requirements

Parts list as an example of the standard configuration

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Sectional drawing (manual start-up)



Parts list (manual start-up)

Pos.	Item	Material
09.1	Bypass branch	*
19	Start-up insert	1.4122
27.1	Bolt	**
29.1	Hexagon nut	**
31.1	O-Ring	*

 Recommended spare/wear parts

* Depending on customer requirements

** Depending on size and pressure rating

Parts list as an example of the standard configuration

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Dimensions EN

DN _R / DN _P	PN	DN _B	Type	L (mm)	S (mm)	H (mm)	Weight (kg)
25	10-16-25-40	25	051-052-053-054	190	153	73	15
	63		055	250	182	90	35
	100		056	250	182	90	35
32	10-16-25-40	25	061-062-063-064	190	153	73	20
	63		065	250	190	90	30
	100		066	250	190	90	30
40	10-16-25-40	25	071-072-073-074	200	155	75	20
	63-100-160		075-076-077	260	190	90	35
50	10-16-25-40	25	081-082-083-084	230	163	90	30
	63		085	300	185	115	50
	100-160		086-087	300	193	110	60
65	10-16-25-40	40	091-092-093-094	290	184	110	40
	63		095	340	219	125	60
	100-160		96-097	340	227	125	85
80	10-16-25-40	40	101-102-103-104	310	191	115	50
	63		105	380	233	140	70
	100-160		106-107	380	240	140	85
100	10-16-25-40	50	111-112-113-114	350	221	125	75
	63		115	430	258	155	105
	100-160		116-117	430	266	155	150
125	10-16-25-40	50	121-122-123-124	400	266	135	105
	63		125	500	280	175	185
	100-160		126-127	500	291	175	225
150	10-16-25-40	65	131-132-133-134	480	295	165	195
	63		135	550	350	190	255
	100		136	550	355	190	270
	160		137	585	355	200	275
200	10-16-25-40	80	151-152-153-154	600	395	200	355
	63		155	650	405	215	470
	100-160		156-157	680	430	225	550
250	10-16-25-40	100	161-162-163-164	730	475	240	500
	63		165	775	520	260	700
	100		166	775	560	260	1000
	160		167	800	560	270	1000
300	10-16-25-40	125	171-172-173-174	850	530	280	1050
	63		175	900	550	300	950
	100-160		176-177	1050	650	360	1600

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Dimensions ASME

DN _R / DN _P	PN	DN _B	Type	L (mm)	S (mm)	H (mm)	Weight (kg)
NPS 1	150	NPS 1	053	215	153	73	15
	300		055	250	190	90	30
	600		056	250	190	90	30
NPS 1,25	150	NPS 1	063	190	153	73	20
	300		065	250	190	90	35
	600		066	250	190	90	35
NPS 1,5	150	NPS 1	073	200	155	75	20
	300		075	260	190	90	35
	600		076	260	190	90	35
NPS 2	150	NPS 1	083	230	163	90	30
	300		085	300	185	115	50
	600		086	300	193	110	60
NPS 2,5	150	NPS 1,5	093	290	174	110	40
	300		095	340	199	125	60
	600		096	340	220	125	85
NPS 3	150	NPS 1,5	103	310	191	115	50
	300		105	380	220	140	70
	600		106	380	240	140	85
NPS 4	150	NPS 2	113	350	211	125	75
	300		115	430	240	155	105
	600		116	430	266	155	150
NPS 5	150	NPS 2	123	400	266	135	100
	300		125	500	290	175	185
	600		126	500	300	175	225
NPS 6	150	NPS 2,5	133	480	295	165	195
	300		135	550	350	190	255
	600		136	550	355	190	270
NPS 8	150	NPS 3	153	600	395	200	355
	300		155	650	405	215	470
	600		156	680	430	225	550
NPS 10	150	NPS 4	163	730	475	240	500
	300		165	775	520	260	700
	600		166	800	560	270	1000
NPS 12	150	NPS 5	173	850	530	280	1020
	300		175	900	550	300	950
	600		176	1050	650	360	1600
NPS 14	300	NPS 6	185	1100	640	340	1360
	600		186	1100	650	350	1510
NPS 16	150	NPS 8	193	1155	678	380	1900