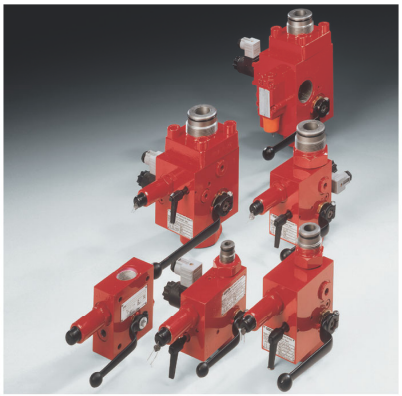
HYDAC INTERNATIONAL



Safety and Shut-off Block
SAF/DSV

1. DESCRIPTION

1.1. GENERAL

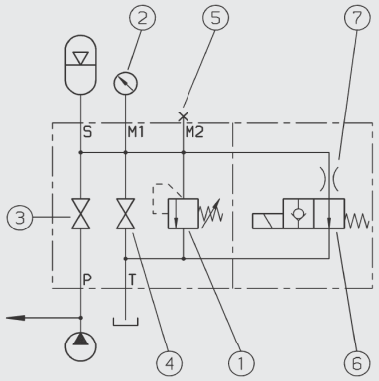
The HYDAC safety and shut-off block is used to shut off and discharge hydraulic accumulators.
It complies with the relevant safety standards in accordance with DIN ISO 4413 and the German Health & Safety at Work regulations, BetrSichV.

The Hydac pressure relief valve DB12 is used on the SAF series. This is a direct-operated pressure relief valve in poppet valve construction with excellent opening and closing properties. This version of the DB12 complies with the requirements of the Pressure Equipment Directive 97/23/EC with CE marking and is supplied with a declaration of conformity and an operating manual.

Please read the Operating Manual! No. 5.169.B

1.1.1 Key to the circuit diagram

Circuit diagram

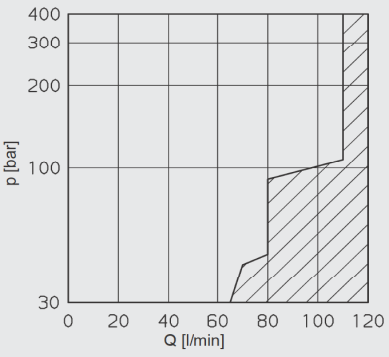


① Safety valve to prevent excessive pressure to PED 97/23/EC
② Pressure gauge
③ Shut-off valve
④ Pressure release valve
⑤ Connection for test gauge

These devices are combined in a compact HYDAC safety and shut-off block. The following devices are also available:

⑥ Solenoid-operated pressure release valve
⑦ Throttle

DB12-CE p-Q graph, see ① above



This valve cannot be set to values in the shaded area

1.1.2 Product benefits

The compact combination of components considerably simplifies the connection of an accumulator or consumer to the hydraulic system and provides the following benefits:

- Minimum of space and maintenance and installation required. As all the individual units are combined in one block, considerably fewer pipe fittings are necessary for installation.
- Considerable reduction in installation time.
- All types of connections for various accumulator designs and manufacturers are available - imperial and metric connections as well as manifold mounted and weld nipple.
- Additional valves such as pilot-operated check valves, flow control valves and combined flow control and check valves can be fitted to the system connection P.

1.2. DESIGN

The SAF safety and shut-off block consists of a valve block, an integrated HYDAC pressure relief valve, a main shut-off valve and a manually operated pressure release valve, and the necessary gauge connections are provided in addition to the tank connection.
In addition an optional solenoid-operated 2-way directional valve allows automatic discharge of the accumulator or consumer and therefore of the hydraulic system in an emergency or for shut-down.

1.3. PORTS

The safety and shut-off block has the following ports:

S – Accumulator port

P – Inline port
connects SAF to the system (pump)

T – Tank port
The connection to the tank must be piped separately.
This will ensure that when the pressure relief valve DB12 opens, flow can drain unpressurised to tank.

M1 – Test gauge port
G 1/2-ISO 228
(G 1/4 at SAF 10)

M2 – Gauge connection
G 1/4-ISO 228

1.4. SPECIFICATIONS

1.4.1 **Operating fluids**
Mineral oil to DIN 51524 Part 1 and Part 2
(other fluids on request)

Viscosity range
min. 10 mm²/s
max. 380 mm²/s

Filtration
Max. permitted contamination level of the operating fluid to ISO 4406 Class 21/19/16 or SAE AS 4059 Class 11.
We therefore recommend a filter with a minimum retention rate of $ß_{20} \geq 100$.
The fitting of filters and regular replacement of the filters guarantees correct operation, reduces wear and tear and extends the service life.

1.4.2 **Permitted operating temperature**
-10 °C ... +80 °C
(ambient temperature on E version limited to -10 °C ... +60 °C)

1.4.3 **Max. operating pressure**
400 bar

1.4.4 **Model with solenoid-operated pressure release**

Type
Solenoid-operated by means of pressure-tight, oil-immersed, single-stroke solenoids in accordance with VDE 0580.
Actuating solenoid with male connector to DIN 43650, standard for general industrial applications, available for 24 V DC and 230 V AC.

Type of current
DC solenoid
When connected to AC voltage, the necessary DC voltage is produced by means of a bridge rectifier connector.

VOLTAGE TOLERANCE:
± 15 % of the nominal voltage

Nominal current
Dependent on the nominal voltage
24 V DC 0.80 A
230 V AC 0.11 A

Power consumption
p_{20} = 18 W
DUTY: Continuous

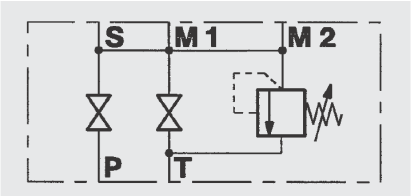
Switching time
Depending on symbol, pressure across the individual ports and flow rate:

WSM06020Y:
on: 50 ms,
off: 35 ms

WSM06020Y:
on: 35 ms,
off: 50 ms

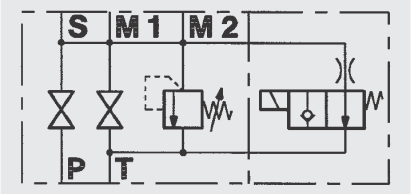
1.5. STANDARD TYPES

1.5.1 **Model with manually operated pressure release valve**
The basic model Safety and Shut-off Block has a manually operated pressure release valve, code "M", and a direct-acting pressure relief valve.



Sizes: SAF10M
SAF20M
SAF32M

1.5.2 **Model with solenoid-operated pressure release**
The E version of the safety and shut-off block has a solenoid-operated 2-way directional valve for automatic pressure release of the accumulator and the hydraulic system in an emergency or for shut-down.



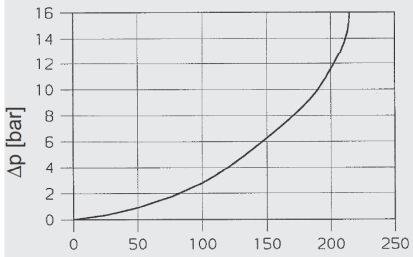
Sizes: SAF10E
SAF20E
SAF32E

1.6. Δp-Q GRAPHS FOR SAF

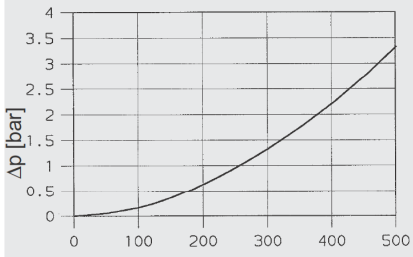
Measured at:
ν = 32 mm²/s
t_{oil} = 40 °C
Operating pressure = 400 bar
with DB12 pressure relief valve

1.6.1 Flow from the pump to the accumulator

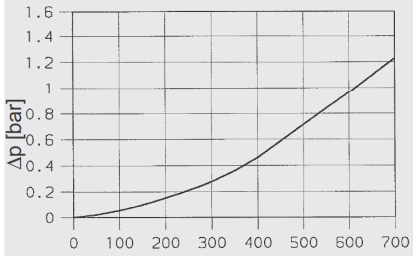
SAF10M/E



SAF20M/E

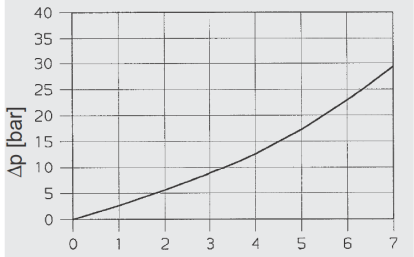


SAF32M/E

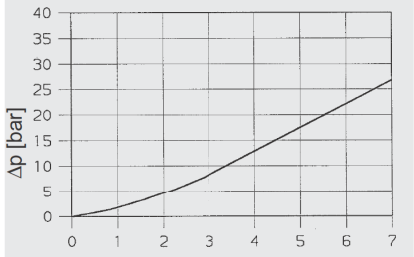


1.6.2 Flow from the accumulator via the solenoid-operated release valve to the tank

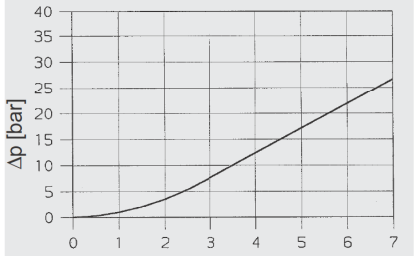
SAF10E



SAF20E

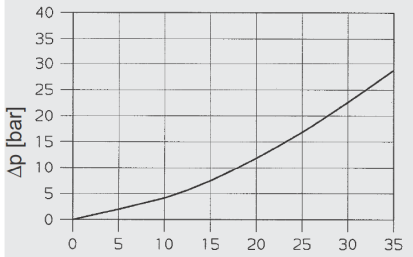


SAF32E

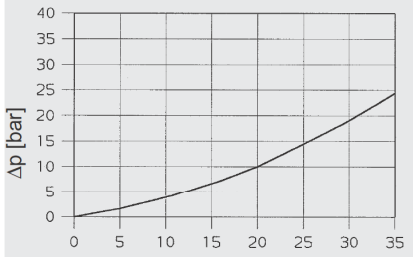


1.6.3 Flow from the accumulator via release valve to the tank

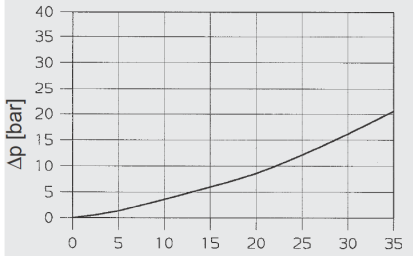
SAF10M/E



SAF20M/E



SAF32M/E



2. MODEL CODE FOR SAF

(also order example)

SAF 20 E 1 2 Y 1 T 210 A – S 13 – LPI

Safety and shut off block
Series SAF

Size of main shut-off valve
10 = DN10
20 = DN20
32 = DN32
32-3 = DN32 with 3 pressure relief valves NG12
50 = DN50

Type of discharge
M = manual discharge
E = solenoid-operated and manual discharge

Block material
1 = carbon steel
other materials [1)]

Material of seals (elastomer)
2 = NBR (Perbunan)
5 = EPDM
6 = FKM (Viton®)
7 = others

Type of directional poppet valve
Y = open when de-energised (2/2 directional valve WSM06020Y)
Z = closed when de-energised (2/2 directional valve WSM06020Z, only up to 350 bar)

Type of voltage - directional poppet valve
1 = 24 V DC
2 = 115 V AC
3 = 230 V AC
6 = 120 V AC
7 = others

Pressure relief valve
T... = pressure-set and lead-sealed by TÜV
N... = pressure-set without TÜV [1)]

Pressure setting
e.g. 210 bar

Threaded connection to
A = ISO 228 (BSP)
B = DIN 13, to ISO 965/1 (metric) [1)]
C = ANSI B1.1 (UNF, O-ring seal to SAE) [1)]

Adapter
to accumulator (see Point 7.)
e.g. S13 = ISO 228 - G 2A

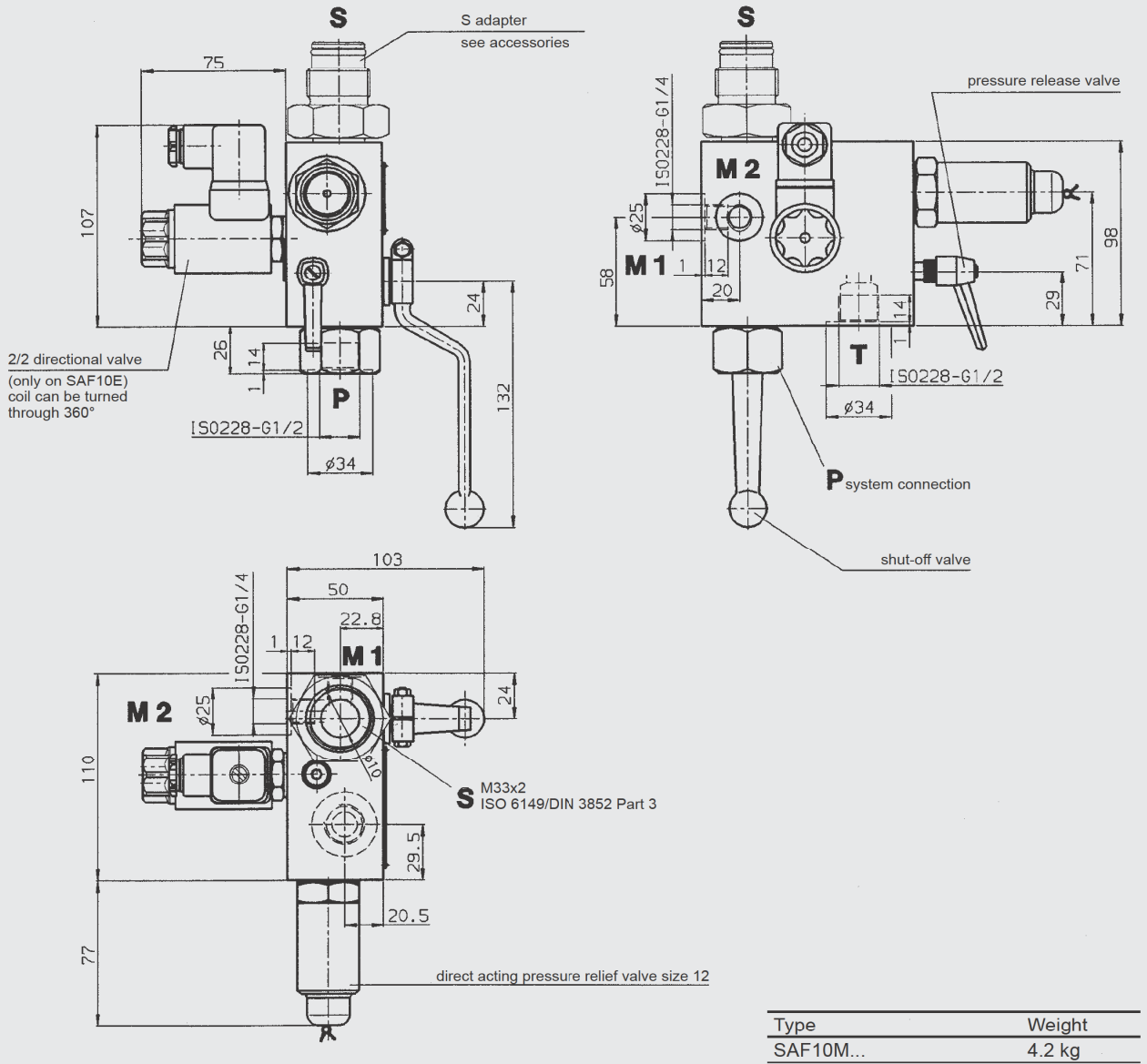
Additional equipment (see Point 5.4.)
L = lockable main shut-off valve (for use with locking device)
LPI = model L with additional position monitoring (inductive proximity switch)
LPM = model L with additional position monitoring (mechanical limit switch with roller lever)
LS = lockable release valve

Accessories
(Please give full details when ordering: see Point 7. Accessories)

[1)] on request

3. DIMENSIONS

3.1. SAF10 SAFETY AND SHUT-OFF BLOCK SIZE 10



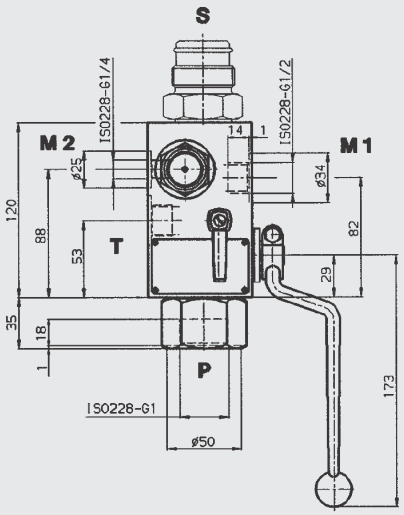
Type	Weight
SAF10M...	4.2 kg
SAF10E...	4.6 kg

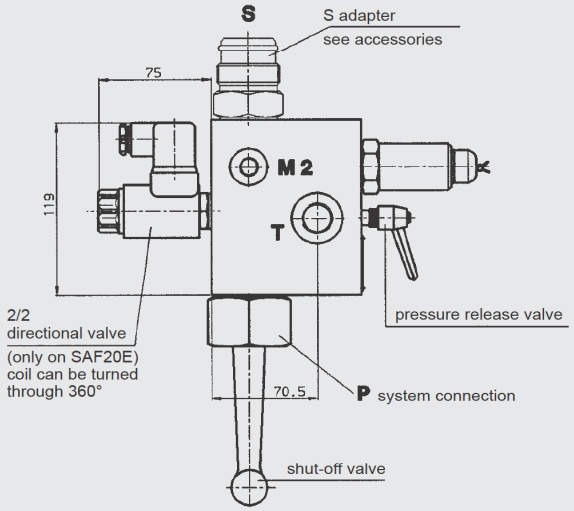
SAF10 Standard types

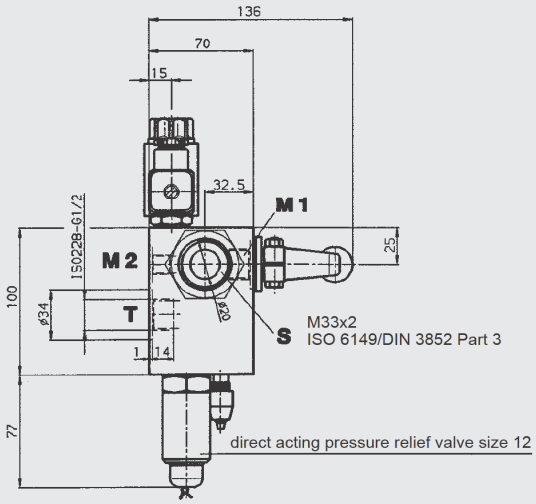
Type	Part no.	Type	Part no.
SAF10M12T400A	2121582	SAF10E12Y1T400A	2125858
SAF10M12T350A	2122208	SAF10E12Y1T350A	2122210
SAF10M12T330A	**2121236***	**SAF10E12Y1T330A**	**2122211***
SAF10M12T315A	2121121	SAF10E12Y1T315A	2122212
SAF10M12T300A	2121354	SAF10E12Y1T300A	2122213
SAF10M12T250A	2121353	SAF10E12Y1T250A	2122214
SAF10M12T210A	2121346	SAF10E12Y1T210A	2121662
SAF10M12T200A	2121351	SAF10E12Y1T200A	2122215
SAF10M12T150A	2121345	SAF10E12Y1T150A	2122216
SAF10M12T100A	2121344	SAF10E12Y1T100A	2122041
SAF10M12T070A	2121350	SAF10E12Y1T070A	2122217
SAF10M12T050A	2122207	SAF10E12Y1T050A	2122218
SAF10M12T035A	2121349	SAF10E12Y1T035A	2122219

* Preferred models

3.2. SAF20 SAFETY AND SHUT-OFF BLOCK SIZE 20







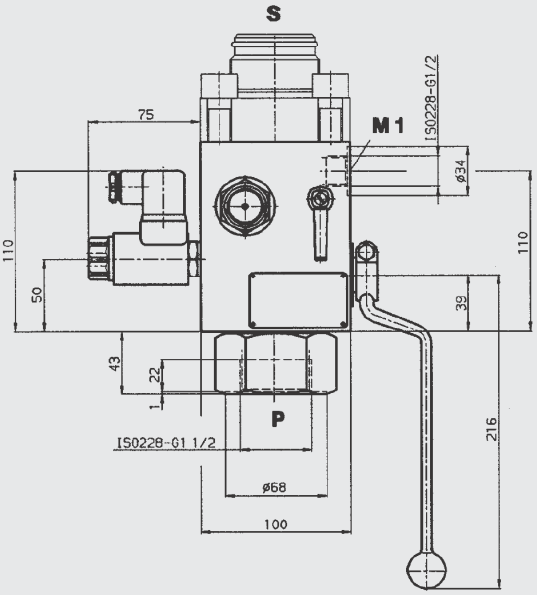
Type	Weight
SAF20M...	6.8 kg
SAF20E...	7.2 kg

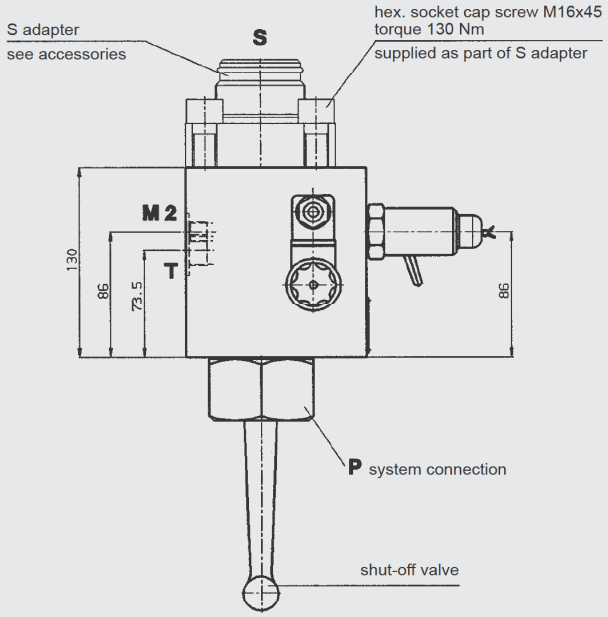
SAF20 Standard types

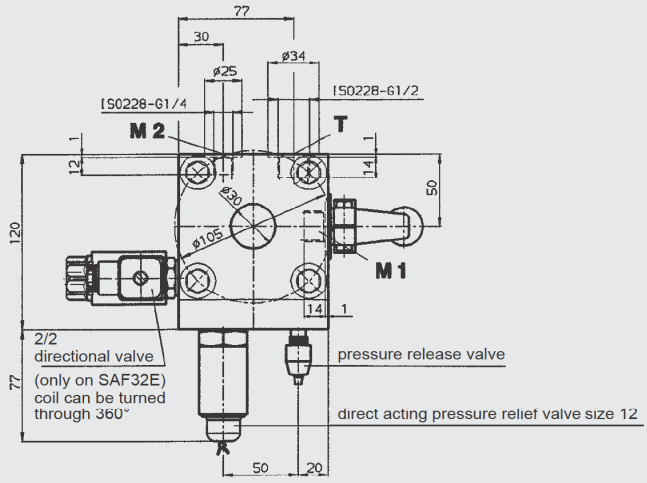
Type	Part no.	Type	Part no.
SAF20M12T400A	2120317	SAF20E12Y1T400A	2121022
SAF20M12T350A	2120434	SAF20E12Y1T350A	2121979
SAF20M12T330A	**2120323***	**SAF20E12Y1T330A**	**2120394***
SAF20M12T315A	2120324	SAF20E12Y1T315A	2120833
SAF20M12T300A	2120332	SAF20E12Y1T300A	2120836
SAF20M12T250A	2120432	SAF20E12Y1T250A	2120851
SAF20M12T210A	2120319	SAF20E12Y1T210A	2120320
SAF20M12T200A	2120325	SAF20E12Y1T200A	2120835
SAF20M12T150A	2120330	SAF20E12Y1T150A	2120832
SAF20M12T100A	2120401	SAF20E12Y1T100A	2120369
SAF20M12T070A	2120326	SAF20E12Y1T070A	2120849
SAF20M12T050A	2122172	SAF20E12Y1T050A	2121000
SAF20M12T035A	2120281	SAF20E12Y1T035A	2122220

* Preferred models

3.3. SAF32 SAFETY AND SHUT-OFF BLOCK SIZE 32







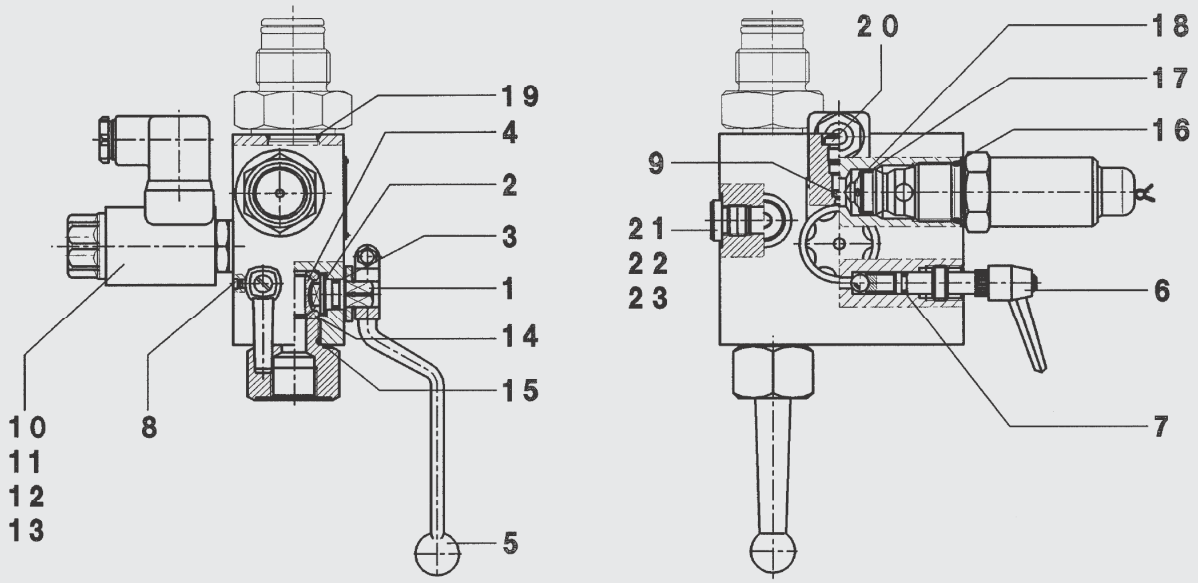
Type	Weight
SAF32M...	12.0 kg
SAF32E...	12.4 kg

SAF32 Standard types

Type	Part no.	Type	Part no.
SAF32M12T400A	2125856	SAF32E12Y1T400A	2123123
SAF32M12T350A	2122230	SAF32E12Y1T350A	3125142
SAF32M12T330A	**2122231***	**SAF32E12Y1T330A**	**2120371***
SAF32M12T315A	2121136	SAF32E12Y1T315A	2122222
SAF32M12T300A	2120837	SAF32E12Y1T300A	2120834
SAF32M12T250A	2122233	SAF32E12Y1T250A	2122223
SAF32M12T210A	2120321	SAF32E12Y1T210A	2120318
SAF32M12T200A	2121135	SAF32E12Y1T200A	2122224
SAF32M12T150A	2121134	SAF32E12Y1T150A	2122225
SAF32M12T100A	2121129	SAF32E12Y1T100A	2122226
SAF32M12T070A	2122234	SAF32E12Y1T070A	2122227
SAF32M12T050A	2121137	SAF32E12Y1T050A	2122228
SAF32M12T035A	2121125	SAF32E12Y1T035A	2122229

* Preferred models

4. SPARE PARTS

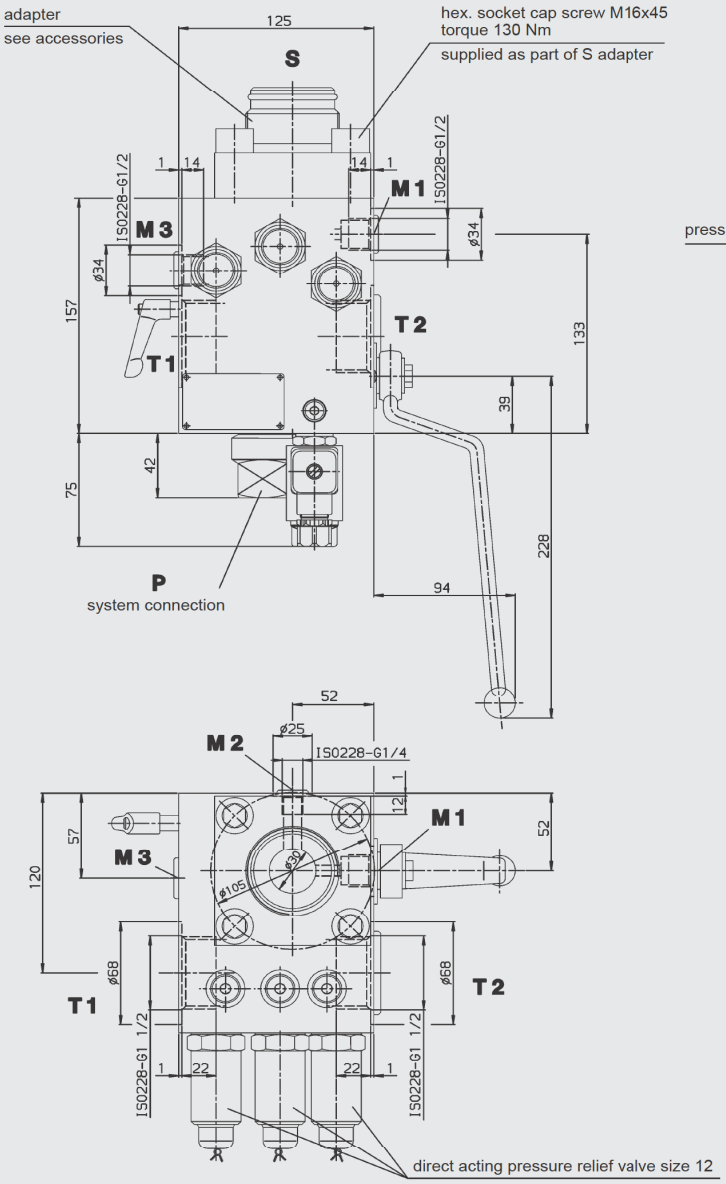


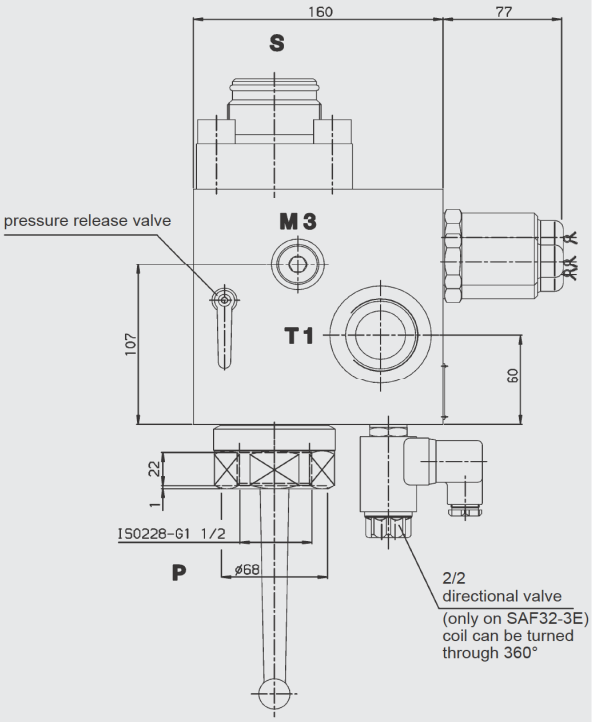
Type of safety and shut-off block		SAF10M, SAF10E	SAF20M, SAF20E	SAF32M, SAF32E
Description	Item	Dimensions or Part no.		
Repair kit consisting of:		2122238 (NBR) 2122240 (FPM)	2122242 (NBR) 2122244 (FPM)	2122246 (NBR) 2122248 (FPM)
Spindle	1			
Disc	2			
O-ring	3	10x2	15x2.5	20x3
Ball	4			
Switching handle	5			
Spindle	6			
O-ring	7	6x2		
Threaded pin	8	M4x6	M4x10	
Orifice	9	Ø1.5 mm (Q_{max} - 25.5 l/min)		
O-ring	11	17x2		
Back-up ring	12	11.7x15x1		
O-ring	13	11x2		
Sealing cup	14			
O-ring	15	21x2	34x2.5	56.7x2.8
O-ring	16	23.47x2.62		
Back-up ring	17	18.3x21.5x1		
O-ring	18	18x2		
O-ring	19	29.7x2.8	29.7x2.8	37.2x3
Blanking plug	20 21 22 23	G 1/8 G 1/4 – –	G 1/8 G 1/4 G 3/8 G 1/2	G 1/8 G 1/4 G 3/8 G 1/2
2/2 directional valve assembly (only for E-version)	10	WSM06020Y - open when de-energised 3153871 (350 bar); 3156869 (400 bar) WSM06020Z - closed when de-energised 3153874 (350 bar); 3156873 (400 bar)		
Blanking plug assembly (converts "E" version to "M" version)		277645		
Seal kit consisting of: Items 3, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23		2121699 (NBR) 2121701 (FPM)	2121703 (NBR) 2121705 (FPM)	2121707 (NBR) 2121709 (FPM)
Spindle repair kit consisting of: Items 6, 7, 8		2115648 (NBR) 2115649 (FPM)		

5. SPECIAL MODELS

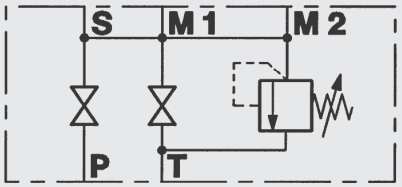
5.1. TYPE SAF32-3M(E)

with 3 direct acting pressure relief valves size 12
(max. operating pressure 400 bar)

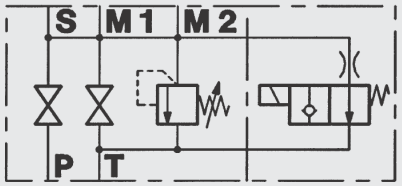




SAF32-3M



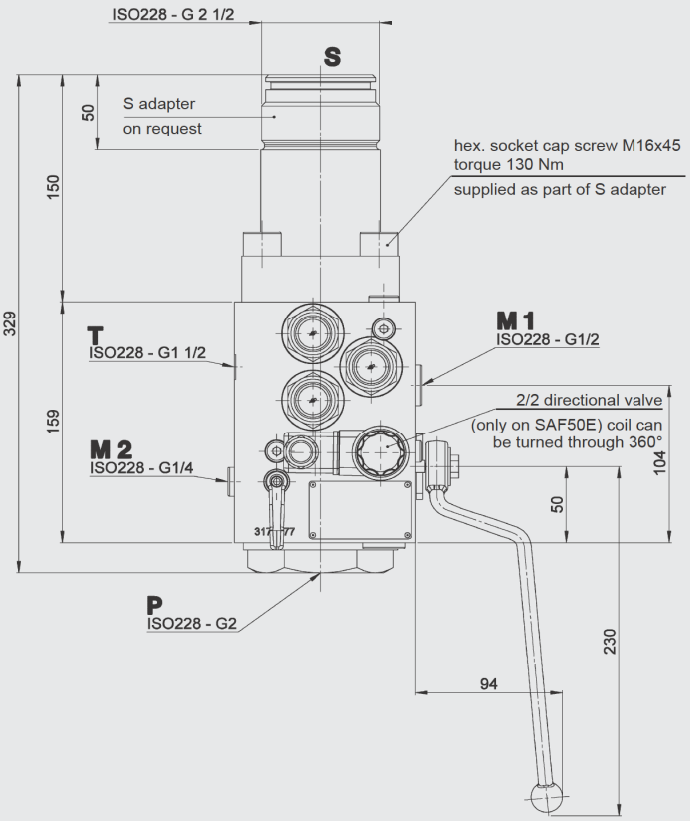
SAF32-3E

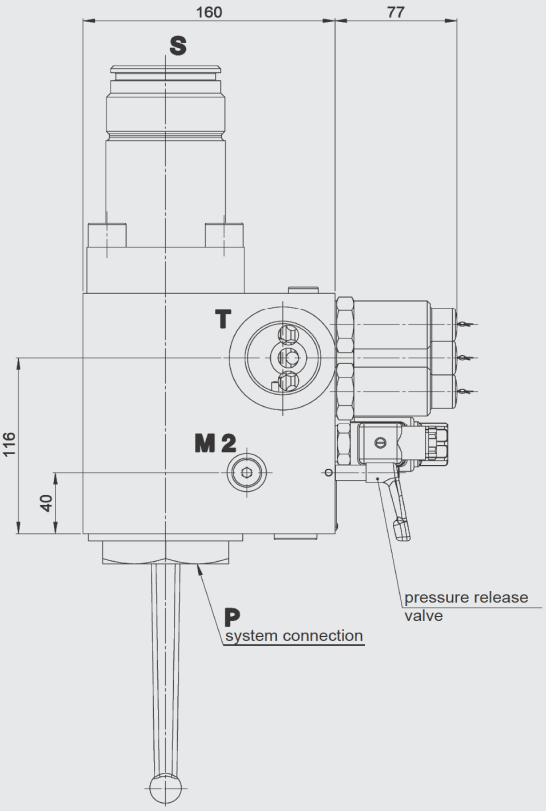


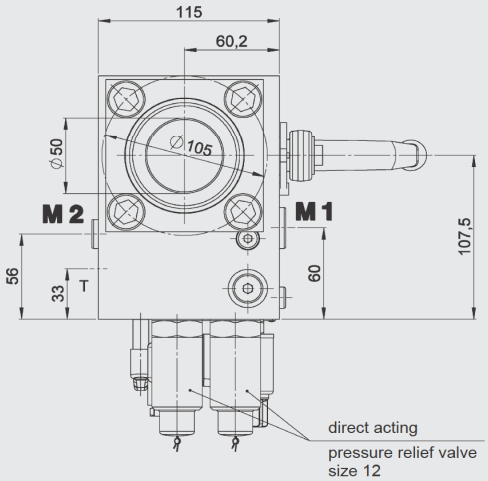
Type	Weight
SAF32-3M...	24 kg
SAF32-3E...	25 kg

5.2. TYPE SAF50M(E)

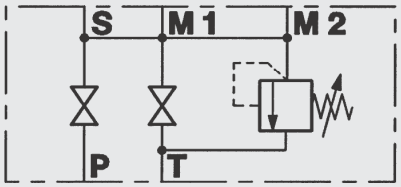
for large flows
with 3 direct acting pressure relief valves size 12
(max. operating pressure 400 bar)



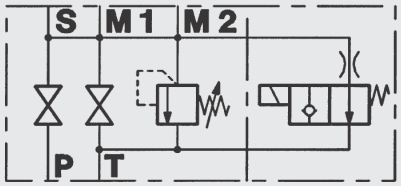




SAF50M



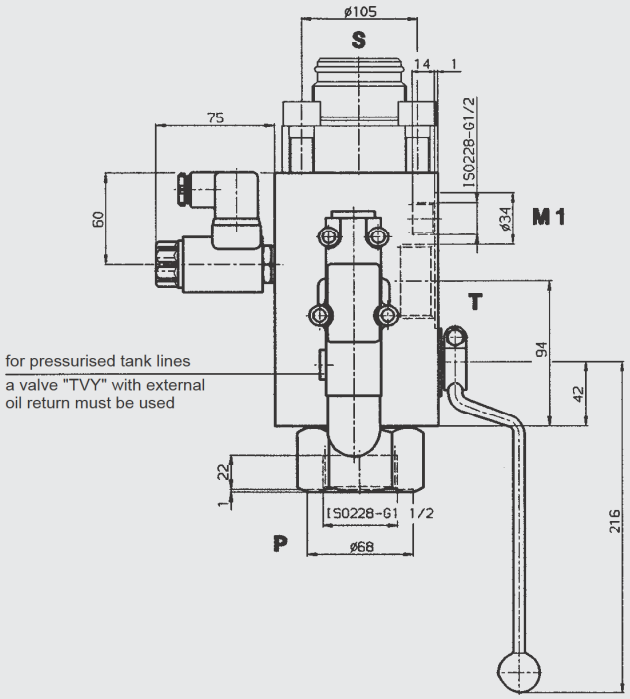
SAF50E

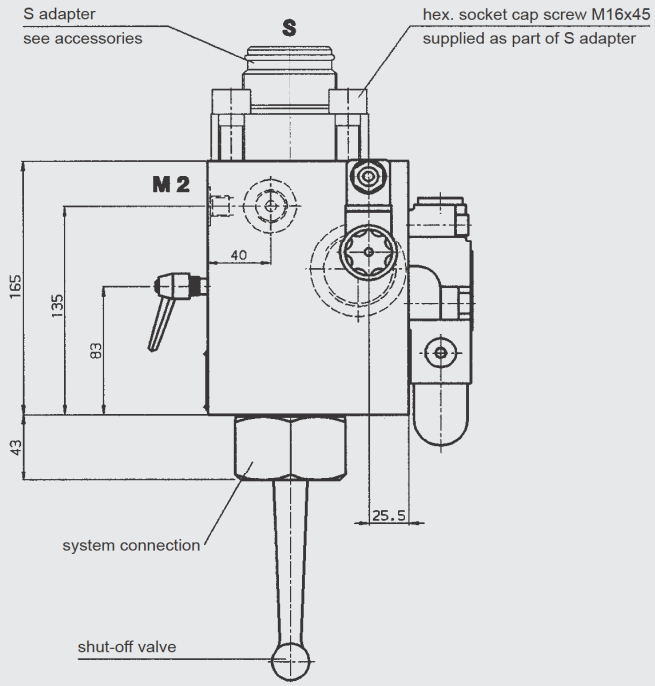


Type	Weight
SAF50M...	25 kg
SAF50E...	26 kg

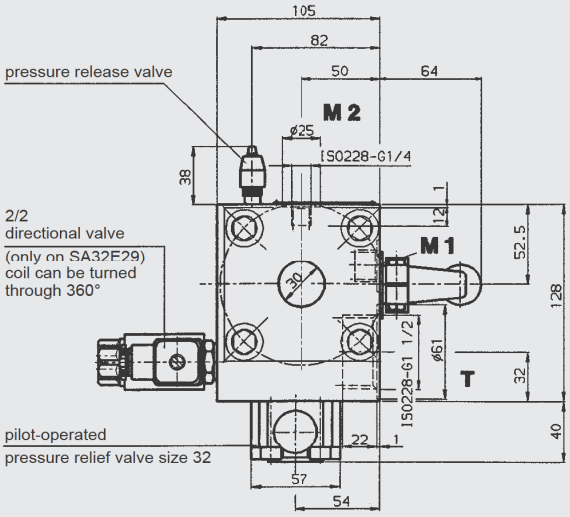
5.3. TYPE SA32M(E)29

with pilot-operated pressure relief valve (Q_{max} = 600 l/min)
(max. operating pressure 330 bar)

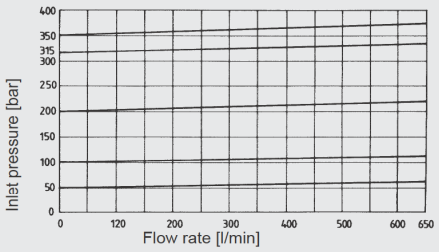




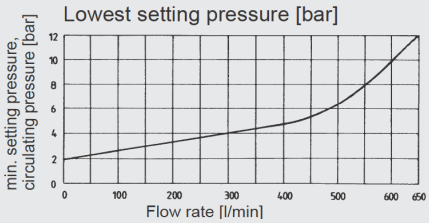
E 3.551.20/09.14



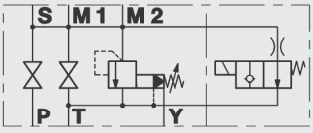
Pilot-operated pressure relief valve size 32



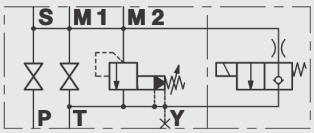
Lowest setting pressure [bar]



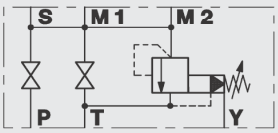
SA32E29TVY



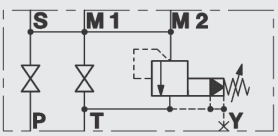
SA32E29TV



SA32M29TVY



SA32M29TV



The safety and shut-off block SA32M(E)29 is equipped with a pilot-operated pressure relief valve size 32 for high flow rates up to 600 l/min.

The E version of the safety and shut-off block has a solenoid-operated 2-way directional valve for automatic pressure release of the accumulator and the hydraulic system in an emergency or for shut-down.

For unpressurized tank lines, valve type "TV" must be used (with internal oil return to tank).

For pressurised tank lines, valve type "TVY" is recommended (with external oil return to tank).

Two different models of the 2-way directional valve are available:

– WSM06020Y (open when de-energised)

– WSM06020Z (closed when de-energised)

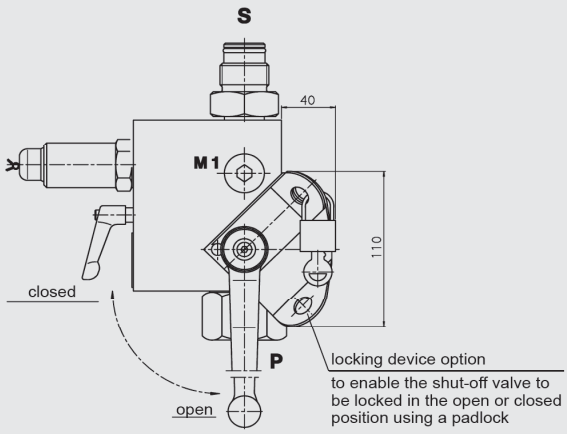
Type	Weight
SA32M29...	22.5 kg
SA32E29...	23.5 kg

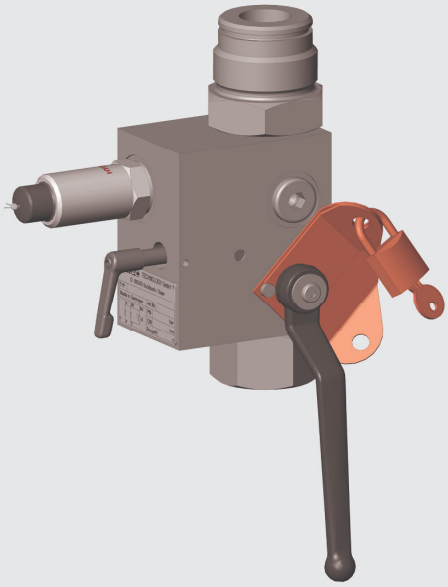
5.4. SAFETY AND SHUT-OFF BLOCK WITH ADDITIONAL EQUIPMENT

Safety and shut-off blocks can be supplied with different options for locking the shut-off valve in position (see Point 2 Type code for SAF) and to lock the release valve (see Point 7. Accessories).

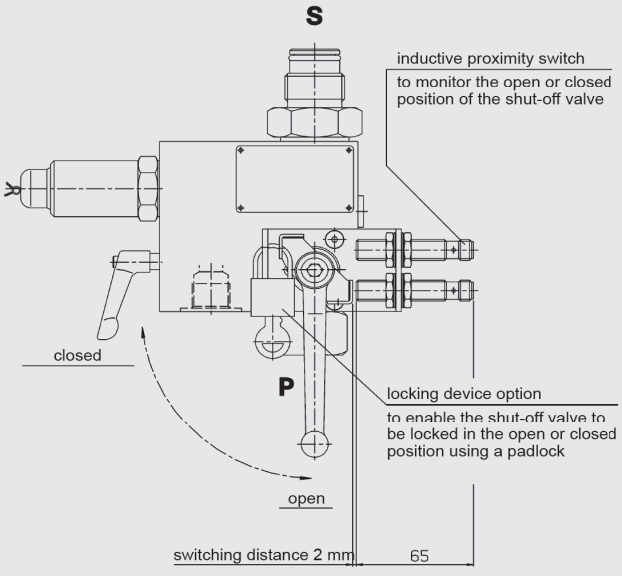
The following overview shows the individual models:

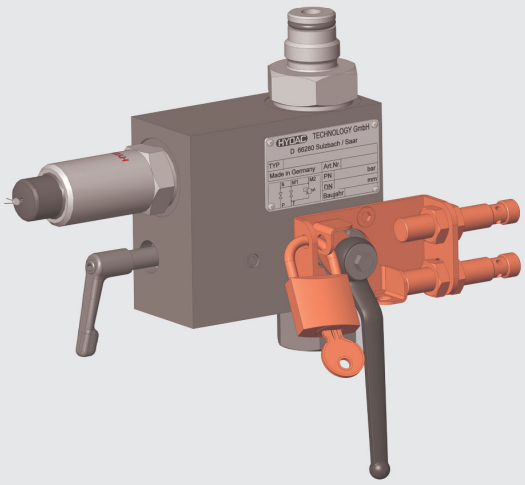
Additional equipment L



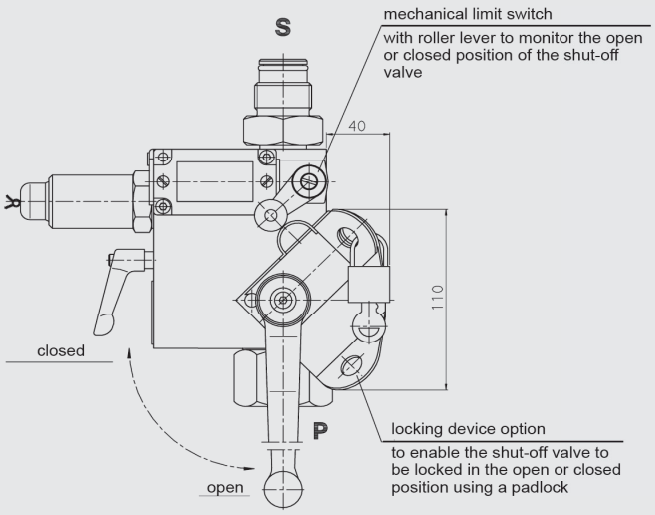


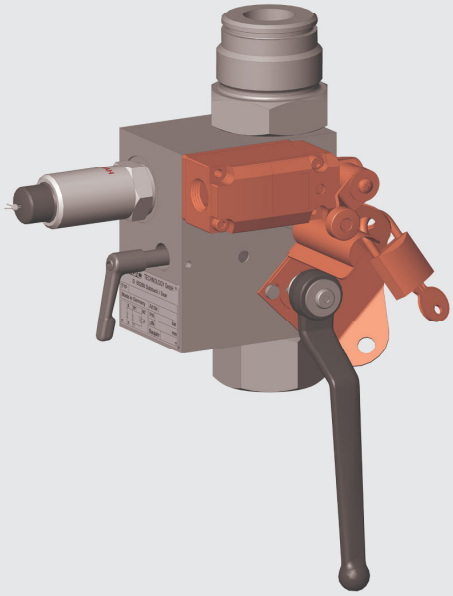
Additional equipment LPI



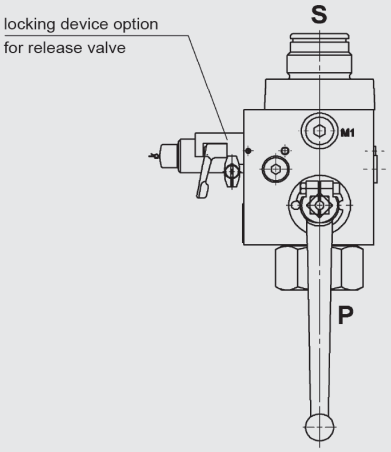


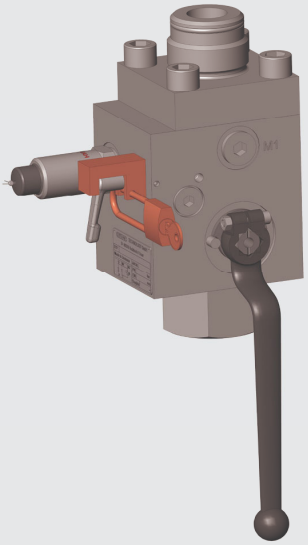
Additional equipment LPM





Additional equipment LS





5.5. SAFETY AND SHUT-OFF BLOCK FOR FRONT PANEL MOUNTING

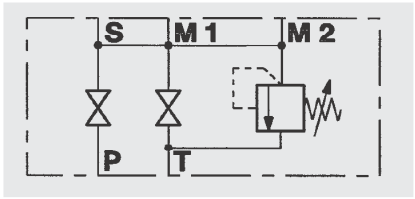
The safety and shut-off block consists of a valve block, a built-in pressure relief valve, a main shut-off valve and a manually operated pressure release valve.

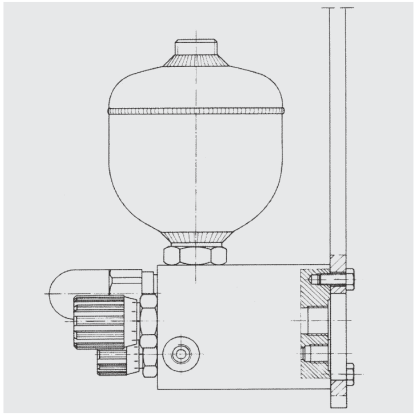
This block is mounted on a front panel with 3 M8 screws. Ports "P" and "T" are located on the mounting side.

Advantages:
The compact design means that the block occupies a minimum of space and ensures minimum maintenance.

Specifications

Type:	SA6M10T...
Size:	DN10
Max. operating pressure:	350 bar
Direct acting pressure relief valve	NG6





5.6. SAFETY AND SHUT-OFF BLOCK WITH 2-WAY CARTRIDGE VALVE (LOGIC ELEMENT)

This safety and shut-off block consists of a valve block, an integrated pressure relief valve and a solenoid-operated 2-way cartridge valve which replaces the main shut-off valve.

Advantages:
In addition to its compact construction, this model is capable of rapid switching to control the oil flow.

5.6.1 Function when using 4/2 directional valve

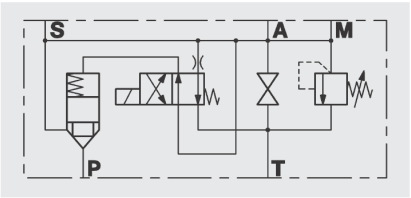
When the 4/2 directional valve is in the switching position shown (open when de-energised), the spring chamber of the logic element is pressurised via the accumulator pressure; the path from P to S is blocked and the hydraulic accumulator is automatically shut off from the system. By connecting the accumulator via the slip-in orifice in the pilot valve to the tank, it will slowly discharge.

When the 4/2 directional poppet valve is in the discharge position (energised) the spring chamber of the logic element is discharged, the path from P to S is open and the accumulator is charged.

Technical specifications:

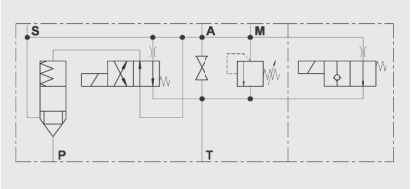
Type	Size	Max. operating pressure	Pressure relief valve [1]
SA20A50T...	DN20	400 bar	NG12 (2)
SA32A50T...	DN30	400 bar	NG12 (3)
SA40A50T...	DN40	400 bar	NG12 (3)

[1] number of pressure relief valves



Type	Size	Max. operating pressure	Pressure relief valve [1]
SA20E50T...	DN20	400 bar	NG12 (2)
SA32E50T...	DN30	400 bar	NG12 (3)
SA40E50T...	DN40	400 bar	NG12 (3)

[1] number of pressure relief valves



5.6.2 Function when using 3/2 directional poppet valve

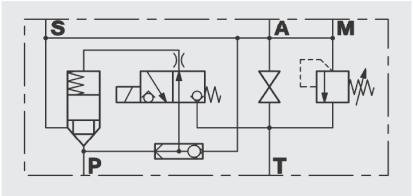
When the 3/2 directional poppet valve is in the switching position shown (open when de-energised), the spring chamber of the logic element is pressurised via the system pressure; the path from P to S is blocked and the accumulator is shut off from the system. When the 3/2 directional poppet valve is in the discharge position (energised) the spring chamber of the logic element is discharged, the path from P to S is open and the accumulator is charged.

If the pump breaks down or if it is switched off, the 3/2 directional poppet valve reverts to the "open when de-energised" position; the accumulator pressure shuts off the logic element via the shuttle change-over valve and shuts off the accumulator from the system.

Technical specifications:

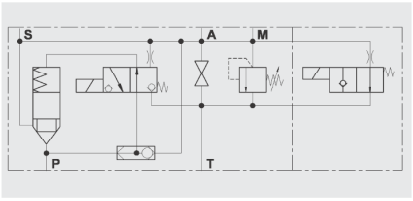
Type	Size	Max. operating pressure	Pressure relief valve [1]
SA20A51T...	DN20	400 bar	NG12 (2)
SA32A51T...	DN30	400 bar	NG12 (3)
SA40A51T...	DN40	400 bar	NG12 (3)

[1] number of pressure relief valves



Type	Size	Max. operating pressure	Pressure relief valve [1]
SA20E51T...	DN20	400 bar	NG12 (2)
SA32E51T...	DN30	400 bar	NG12 (3)
SA40E51T...	DN40	400 bar	NG12 (3)

[1] number of pressure relief valves



6. DESCRIPTION OF DSV10

6.1. GENERAL

DSV10 as a "Low Cost Alternative" to SAF10

The three-way safety block DSV10 is used to isolate and discharge hydraulic accumulators and consumers. It complies with relevant safety standards in accordance with DIN EN 4413 and the German Health & Safety at Work regulations, BetrSichV.
The HYDAC pressure relief valve DB12 is used with the DSV series. This is a direct-operated pressure relief valve in poppet valve construction with excellent opening and closing characteristics.
This version of the DB12 complies with the requirements of the Pressure Equipment Directive 97/23/EC with CE marking. There are four different models:

- DSV10M, manual discharge, standard L-ball
- DSV10M-T-ball, manual discharge, t-ball
- DSV10EY, manual/solenoid-operated discharge, open when de-energised
- DSV10EZ, manual/solenoid-operated discharge, closed when de-energised

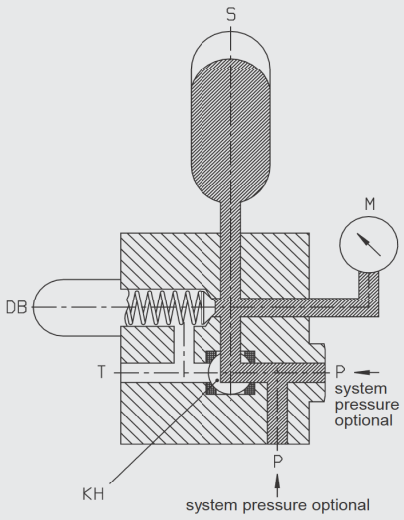
The essential difference compared to the SAF10 lies in the shut-off and discharge function of the DSV10. On request we can supply other models to cover almost all applications, e.g. for aggressive media.

On request we can supply test certificates to EN 10204 and quality test certificates to DIN 55350, Part 18.

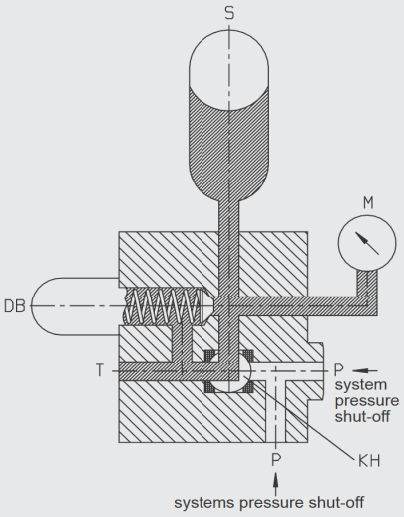
6.2. DESIGN

The DSV three-way safety block consists of a valve block with an integrated pressure relief valve and the shut-off valve. It has ports for the pump, pressure gauge, tank and accumulator.
In addition, an optional solenoid-operated 2-way directional valve allows automatic discharge of the accumulator or consumer.

Accumulator operation



Shutting off the system pressure and simultaneously discharging of the accumulator



P - pump connection
S - accumulator
KH - change-over ball valve
DV - pressure relief valve
M - pressure gauge
T - tank connection

The DSV10 can be used as a cost-effective alternative to the SAF10. Unlike the SAF10, the DSV10 shuts off when discharging simultaneously to the tank.

6.3. PORTS

The DSV has the following ports:

S – Accumulator port (M33x2 DIN 3852 part 3)
P – Inline port (G 3/8 and G 1/2)
T – Tank port (G 1/4)
M – Pressure gauge port (G 1/4)

6.4. FUNCTION

When the accumulator is in operation the change-over ball valve connects the pump port with the accumulator. At the same time the accumulator is monitored for pressure via the built-in pressure relief valve.
By switching over the ball valve, the pump port is shut off leakage-free on the inlet side and the accumulator is discharged simultaneously to the tank.

During switching all three ports (P, S and T) are momentarily interconnected (negative switching overlap). If a solenoid-operated 2/2 directional poppet valve is installed, automatic discharge is possible (e.g. in the event of a power failure or shut-down).

6.5. NOTES

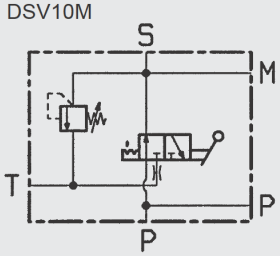
Ball valves are not designed to be used as flow control valves; therefore they should always be either fully open or fully closed to avoid damaging the sealing cups.

To ensure correct functioning, pressure and temperature specifications must be observed.

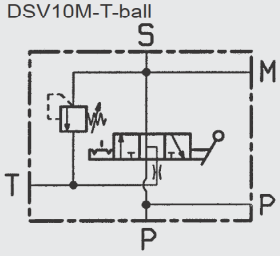
6.6. SPECIFICATIONS

6.6.1 Symbols

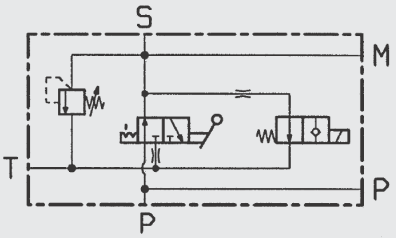
DSV10M



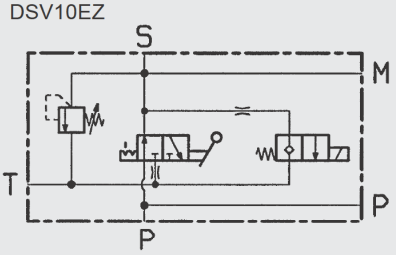
DSV10M-T-ball



DSV10EY



DSV10EZ



6.6.2 Type of construction

Ball valve isolating device

Pressure relief valve is a direct-acting poppet seat valve

Poppet valve is pilot-operated

6.6.3 Materials

Housing and blanking plug in steel, surface protection: phosphate-plated. Ball in steel, hard-chromed
Pressure relief valve and poppet valve in high tensile steel, closing element in hardened and ground steel, wear-resistant, surface protection: phosphate-plated
Ball seal in high quality synthetic material (POM) Soft seals in Perbunan (NBR)
Cranked handle SW09 in red anodised aluminium.

6.6.4 Mounting position

optional

6.6.5 Operating fluids

Mineral oil to DIN 51524 Part 1 and Part 2
(other fluids on request)

Viscosity range
min. 10 mm²/s
max. 380 mm²/s

Filtration:
Max. permitted contamination of the operating fluid to ISO 4406 Class 21/19/16 or SAE AS 4059 Class 11.
We therefore recommend a filter with a minimum retention rate of $ß_{20} \geq 100$. The fitting of filters and the regular replacement of filter elements guarantees correct operation, reduces wear and tear and increases the service life.

6.6.6 Permitted operating temperature

-10 °C ... +80 °C

(ambient temperature for E version limited to -10 °C ... +60 °C)

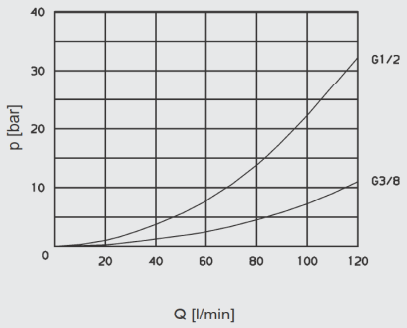
6.6.7 Maximum operating pressure

350 bar

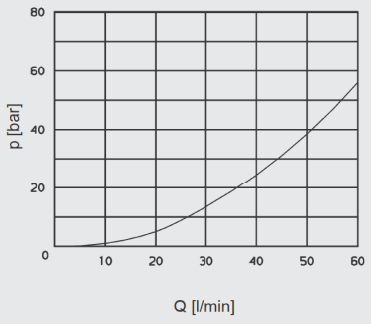
6.6.8 Δp - Q graph

measured at
t_{oil} = 50 °C
ν = 30 mm²/s

Flow rate from P to S



Flow rate from S to T



6.6.9 Model with solenoid-operated pressure release

Type
Solenoid-operated by means of pressure-tight, oil-immersed, single-stroke solenoids in accordance with VDE 0580. Actuating solenoid with male connector to DIN 43650, standard for general industrial applications, available for 24 V DC and 230 V AC.

Type of current
DC solenoid
When connected to AC voltage, the necessary DC voltage is produced by means of a bridge rectifier connector.

Voltage tolerance
± 15 % of the nominal voltage

Nominal current
dependent on the nominal voltage
24 V DC 0.80 A
230 V AC 0.11 A

Power consumption
p_{20} = 18 W

Duty
Continuous

Switching time
Depending on symbol, pressure across the individual ports and flow rate
WSM06020Y:
on: 50 ms,
off: 35 ms
WSM06020Y:
on: 35 ms,
off: 50 ms

6.7. SPARE PARTS

please see brochure:

- 3-way safety block DSV No. 5.251

6.8. MODEL CODE FOR DSV10

(also order example)

DSV 10 M . – 4 . 1 / 1 / X / T ... – G 24 – Z4 ...

3-way safety block

Nominal size
10

Discharge
M = manual discharge
E = solenoid-operated and manual discharge

For manual/solenoid-operated discharge, also indicate
Y = open when de-energised
Z = closed when de-energised

Type of pressure relief valve
4 = DB12

With/without fitted pressure relief valve
1 = with pressure relief valve
0 = without pressure relief valve

Accumulator connection
1 = M33x2

Series
(determined by manufacturer)

Setting of pressure relief valve
T = pressure-set and lead-sealed by TÜV
V = adjustable using tool
F = preset by manufacturer
x = no details (for model without relief valve cartridge)

Pressure setting
... = pressure setting
... = pressure range
xxx = no details (for model without relief valve cartridge)

Pressure setting range
DB12 – 150 bar
DB12 – 250 bar
DB12 – 350 bar

Type of voltage for solenoid
G = DC voltage
W = AC voltage

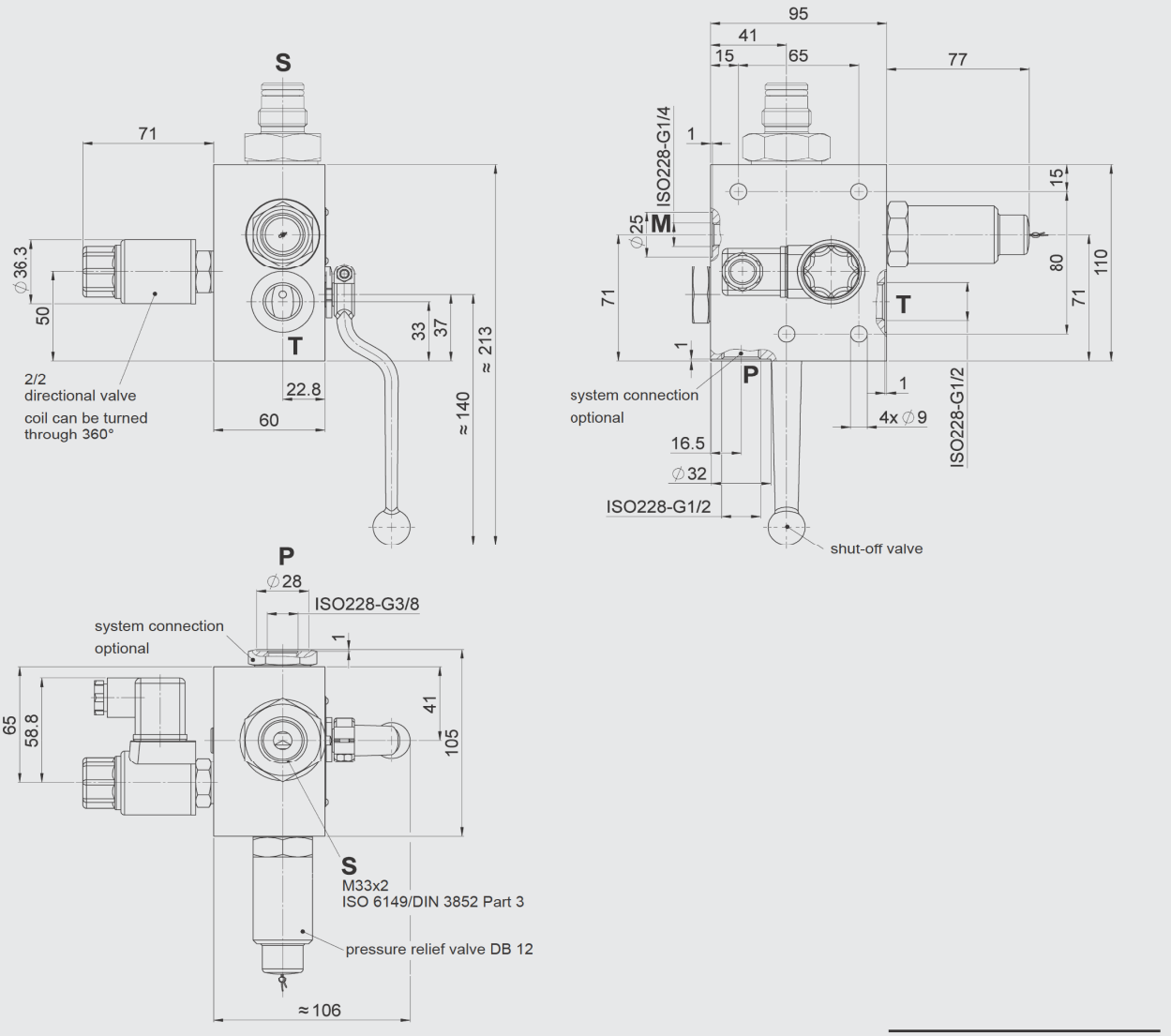
Nominal voltage for solenoid
24 = 24 Volt for type G voltage (DC)
230 = 230 Volt for type W voltage (AC)

Type of connection for solenoid
Z4 = connector to DIN 43650 - AF2 - PG11

Supplementary details
T-Ball = ball bore (180° switch)
FKM (Viton®) = O-ring seal

6.9. DIMENSIONS

DSV10 3-way safety block



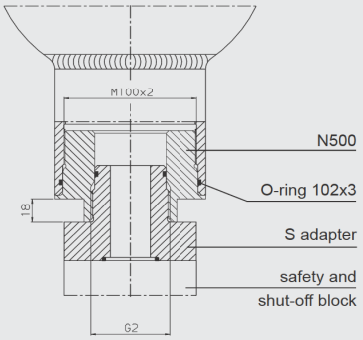
Type	Weight
DSV10M	3.5 kg
DSV10E...	3.9 kg

SAF10 Standard types

Type	Part no.	Type	Part no.
DSV-10-M-4.0/1/X/XXXX	555999	DSV-10-EY-4.0/1/X/XXXX-G24-Z4	557367
DSV-10-M-4.1/1/X/T035	555968	DSV-10-EY-4.1/1/X/T035-G24-Z4	555980
DSV-10-M-4.1/1/X/T035	555969	DSV-10-EY-4.1/1/X/T050-G24-Z4	555981
DSV-10-M-4.1/1/X/T070	555970	DSV-10-EY-4.1/1/X/T070-G24-Z4	555982
DSV-10-M-4.1/1/X/T100	555971	DSV-10-EY-4.1/1/X/T100-G24-Z4	555983
DSV-10-M-4.1/1/X/T150	555972	DSV-10-EY-4.1/1/X/T150-G24-Z4	555984
DSV-10-M-4.1/1/X/T200	555973	DSV-10-EY-4.1/1/X/T200-G24-Z4	555985
DSV-10-M-4.1/1/X/T210	555974	DSV-10-EY-4.1/1/X/T210-G24-Z4	555986
DSV-10-M-4.1/1/X/T250	555975	DSV-10-EY-4.1/1/X/T250-G24-Z4	555987
DSV-10-M-4.1/1/X/T300	555976	DSV-10-EY-4.1/1/X/T300-G24-Z4	555988
DSV-10-M-4.1/1/X/T315	555977	DSV-10-EY-4.1/1/X/T315-G24-Z4	555989
DSV-10-M-4.1/1/X/T330	555978	DSV-10-EY-4.1/1/X/T330-G24-Z4	555990
DSV-10-M-4.1/1/X/T350	555979	DSV-10-EY-4.1/1/X/T350-G24-Z4	555991

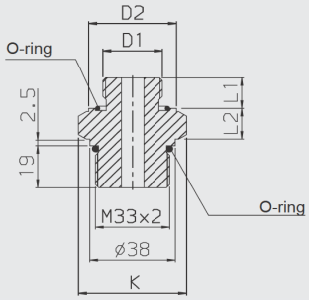
7. ACCESSORIES

7.1. ADAPTERS FOR LOW PRESSURE BLADDER ACCUMULATORS



Type	Accumulator type	Volume [l]	Adapter	Part no. [1] NBR/Carbon steel	Corresponding S adapter	Part no. [1] NBR/Carbon steel
SAF10/20 and DSV10	SB35	2.5 ... 50	N500	367229	S 13	369481
SAF32					S 309	366715

7.2. ADAPTERS FOR DIAPHRAGM ACCUMULATORS



Type	Accumulator type	Volume [l]	D1 Thread	Part no. [1] NBR/Carbon steel	Adapter	K SW	L1 [mm]	L2 [mm]	D2 [mm]	O-ring
SAF10/20 DSV10	SBO...E-	0.075 ... 1.4	G 1/2 A	369485	S 30	41	14	17.5	33	22x3
	SBO...A6-	0.1 ... 210-1.3								
	SBO...E-	2.0 ... 3.5	G 3/4 A	369486	S 31		16		40	28x3
	SBO...A6-	1.3 ... 4								

[1] others on request

7.3. ADAPTERS FOR PISTON ACCUMULATORS

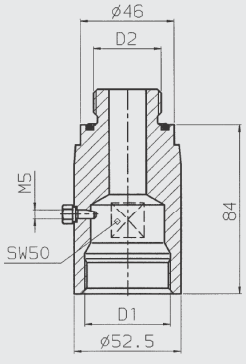


Diagram 1

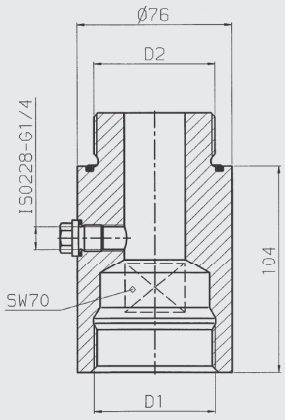
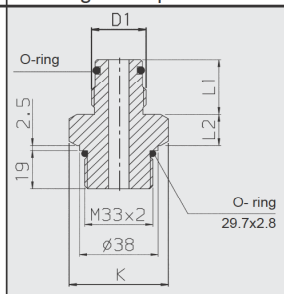
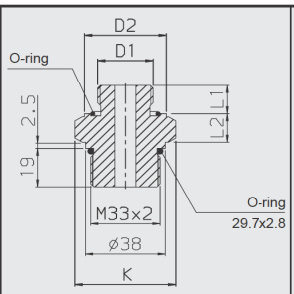
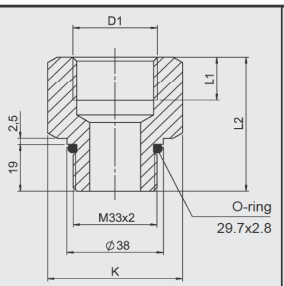
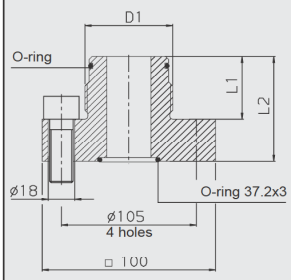
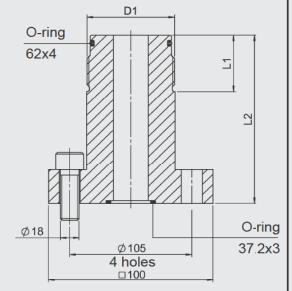
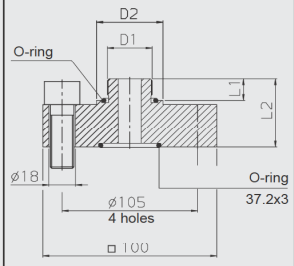
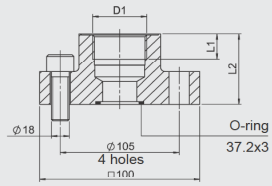


Diagram 2

Type	Accumulator type	Volume [l]	Adapter	Part no. [1] NBR/Carbon steel	Diag.	D1 [mm]	D2 [mm]	O-ring	Corresponding S adapter	Part no. [1] NBR/Carbon steel
SAF10/20 DSV10	SK210/350 -	2.5 ... 7.5	K 406	374929	1	G 1 1/4	G 1	35x3	S 12	369480
	SK210/350 -	10 ... 45	K 408	374931	2	G 2	G 1 1/2	53x3	S 13	369481
SAF32	SK210/350 -	50 ... 120	K 409	374933			G 2	62x3	S 309	366715

[1] others on request

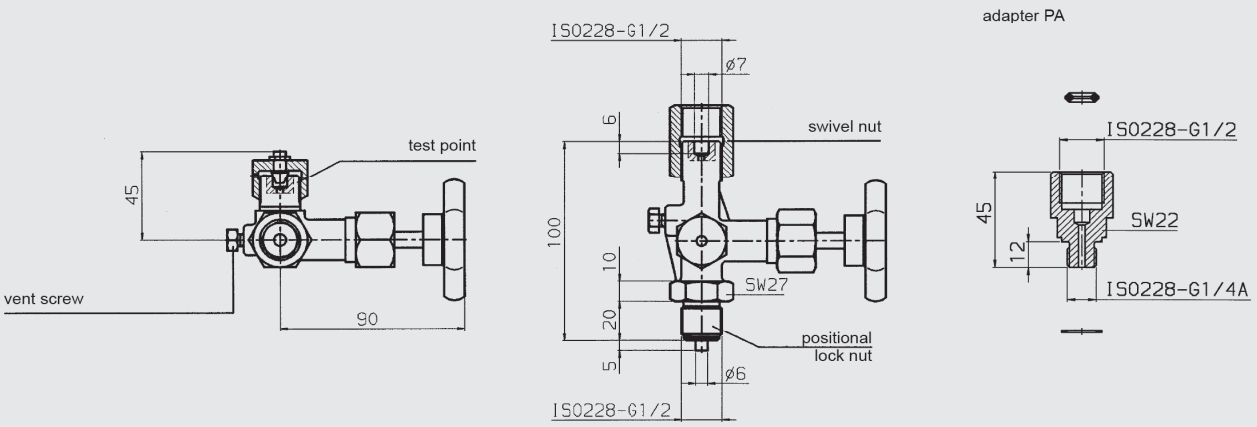
7.4. ADAPTERS FOR STANDARD BLADDER ACCUMULATOR

Type	Drawing of adapters
SAF10 SAF20 DSV10	 Diagram 1  Diagram 2  Diagram 3
SAF32	 Diagram 4  Diagram 5  Diagram 6  Diagram 7

Type	Accumulator type	Volume [l]	D1 Thread	Adapter	Part no. [2] NBR/Carbon steel	K SW [mm]	L1 [mm]	L2 [mm]	D2 [mm]	O-ring [mm]	Diag.
SAF10 SAF20 DSV10	SB330/400-	0.6 ... 1	G 3/4A	S 10	**369479***	41	28	16	–	17x3	1
	SB550/690-	1 ... 5	G 1A	S 11	372750	46	34	17	–	22x3	
	SB330/400-	2.5 ... 6	G 1 1/4A	S 12	**369480***		37		–	30x3	
	SB330/400/ 550/600-	10 ... 50	G 2A	S 13	**369481***	65	44	21	–	48x3	
	Connection with metric fine thread	–	M30x1.5	S 20	369482	41	15	18	40	32x2	2
		–	M40x1.5	S 21	369483	55	20	21	54	43x3	
		–	M50x1.5	S 22	369484	65			64	53x3	
	SB330/400-	2.5 ... 50	G 3/4	S 367861	369489	41	18	50	–	–	3
			G 1	S 379766	369490	46	20	55	–	–	
			G 1 1/4	S 379767	369498	65	22	60	–	–	
SAF32	SB330/400-	0.6 ... 1	G 3/4A	S 305 [1]	366723	–	28	58	–	17x3	4
	SB550/690-	1 ... 5	G 1A	S 306 [1]	2102855	–	34	64	–	22x3	
	SB330/400-	2.5 ... 6	G 1 1/4A	S 307 [1]	366724	–	37	67	–	30x3	
	SB330/400/600-	10 ... 50	G 2A	S 309 [1]	**366715***	–	44	74	–	48x3	5
	SB550-	10 ... 50		S 308 [1]	376813	–		115	–		
	SB330H-	10 ... 50	G 2 1/2A	S 365922	377283	–	50	150	–	62x4	
	Connection with metric fine thread	–	M30x1.5	S 330 [1]	366735	–	15	47	45	32x2	6
		–	M40x1.5	S 340 [1]	366736	–	20	51	60	43x3	
		–	M50x1.5	S 350 [1]	366737	–			75	53x3	
	SB330/400-	10 ... 50	G 1	S 365637	2106583	–	20	60	–	–	7
			G 1 1/4	S 369658	2106578	–	22		–	–	
			G 1 1/2	S 237838	2103869	–	24	65	–	–	

* Preferred models
[1] Adapter supplied with 4 off hex. socket cap screws M16x45 (part no. 6032726) Torque 130 Nm
[2] others on request

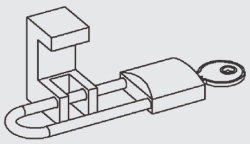
7.5. GAUGE ISOLATOR VALVE



Part no.	Description	consisting of:
611903	Shut-off valve AG DIN 16271	Release valve
		Swivel nut
		Positional lock nut
		Test point
370754	Adaptor PA G1/4A-G1/2	

7.6. SPINDLE SAFETY MECHANISM

Safety mechanism on the release valve on the SAF block to prevent adjustment.
For attachment on SAF, see Point 5.4. Safety and Shut-Off Block with supplementary equipment, type LS.



Part no.	Description	consisting of:
3580490	Spindle safety mechanism SAF	- Spindle safety mechanism SAF - Padlock

7.7. ACCUMULATOR CHARGING VALVE

HYDAC accumulator charging valves control, within an adjustable switching range, the charging of the accumulator. By combining the charging valve with an accumulator, pumps and motors on hydraulic plants with fluctuating flow requirements can be sized smaller. This saves costs and energy - thus preventing unnecessary heat development.

For further information and technical specifications, see catalogue section:

- DLHSD DLHSR Accumulator charging valve
  No. 5.190.1

8. NOTE

The information in this brochure relates to the operating conditions and applications described.

For applications and/or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.