

12. Safety & Shut-off Block(1)

1 FSV/FSAF Series



General Description/Specification

FSAF Safety & Shut-off Block is used between accumulator and hydraulic system to control oil break of accumulator, over pressure protection and oil release. It is mainly composed of a main stop valve, a built-in overflow valve and a manual pressure relief valve. The valve block with electromagnetic reversing valve is used for automatic unloading of hydraulic system and accumulator.

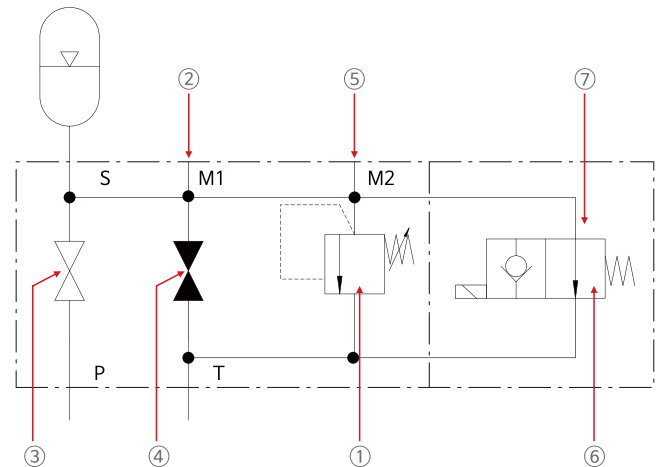
- Max. operating pressure
 - 360/400 bar
- Materials
 - Body : Carbon Steel.
 - Sealing : NBR - Standard (FKM, EPDM as option)
- Operating fluids
 - Mineral oil to DIN 51524
 - Part 1 and Part 2 (other fluids on request)
- Viscosity range
 - Min. 10 mm² /s ~ Max. 380 mm² /s
- Filtration
 - Max. permitted contamination level of the operating fluid to ISO 4406 Class 21/19/16 or SAE AS 4059 Class 11.
 - Filter with a minimum retention rate of $\beta_{20} \geq 100$.
- Permitted operating temperature
 - 10 °C ... +80 °C (ambient temperature on E version limited to -10 °C... +60 °C)
- Electric data
 - (Model with solenoid-operated pressure release)
 - DC : 24V, AC : 110V or 230V-50/60Hz.
 - 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 : $\pm 15\%$ 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
 - p20 = 18 W
 - DUTY: Continuous

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

Product 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

Key to the circuit diagram



Name of each parts

- 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
- ⑥ Solenoid-operated pressure release valve
- ⑦ Throttle

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

- [Note]** The connection to the tank must be piped separately. This will ensure that when the pressure relief valve 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

12. Safety & Shut-off Block(2)

2 FSAF Series(1)

Ordering Model Code for a Safety & Shut-off Block

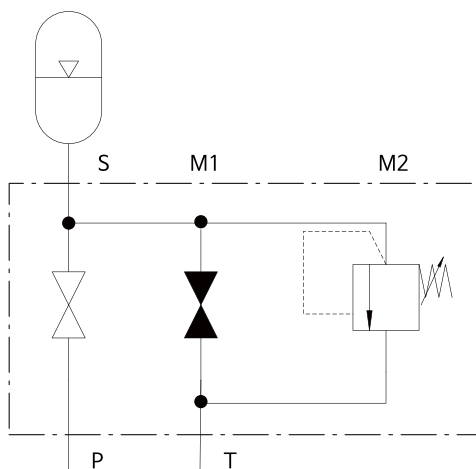
FSAF - **20** - **M** - **1** - **2** - **Y** - **1** - **N** - **210** - **A** - **S13**

01
 02
 03
 04
 05
 06
 07
 08
 09
 10
 11

01 Safety and shut off block FSAF Series	02 Size of main shut-off valve 10mm, 20mm, 32mm	03 Type of discharge(Unloading way) <u>M</u> manual discharge <u>E</u> solenoid-operated and manual discharge	04 Block material <u>1</u> Carbon steel(Standard) Other materials on request.
05 Material of seals (elastomer) <u>2</u> NBR(Perbunan) <u>5</u> EPDM <u>6</u> FKM(Viton) <u>7</u> Others	06 Type of Solenoid valve acting (Directional poppet valve) <u>Y</u> open when de-energised (Unloading) <u>Z</u> closed when de-energised (Unloading)	07 Type of voltage (directional poppet valve) <u>1</u> 24V DC <u>2</u> 115V AC <u>3</u> 230V AC <u>7</u> Others	08 Pressure relief valve <u>T</u> pressure-set and lead-sealed by inspector <u>N</u> pressure-set adjustable by wrench
09 Pressure setting value e.g. 210 bar (adjustable up to 315bar)	10 Standard threaded connection to <u>A</u> ISO 228(BSP)	11 Adapter to accumulator e.g. such as B27 or F02 (see page 45 to 47)	

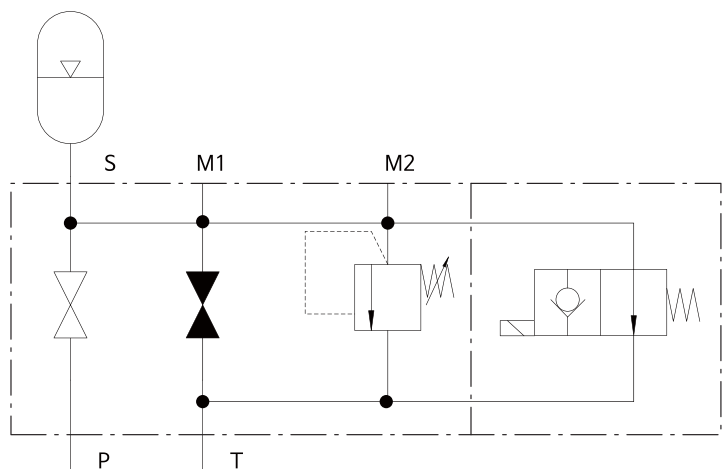
Circuit Diagram for Standard Types

Model with manually operated pressure release valve



Type of discharge/Unloading way : M version
- Sizes : FSAF10M, FSAF20M, FSAF32M

Model with solenoid-operated pressure release



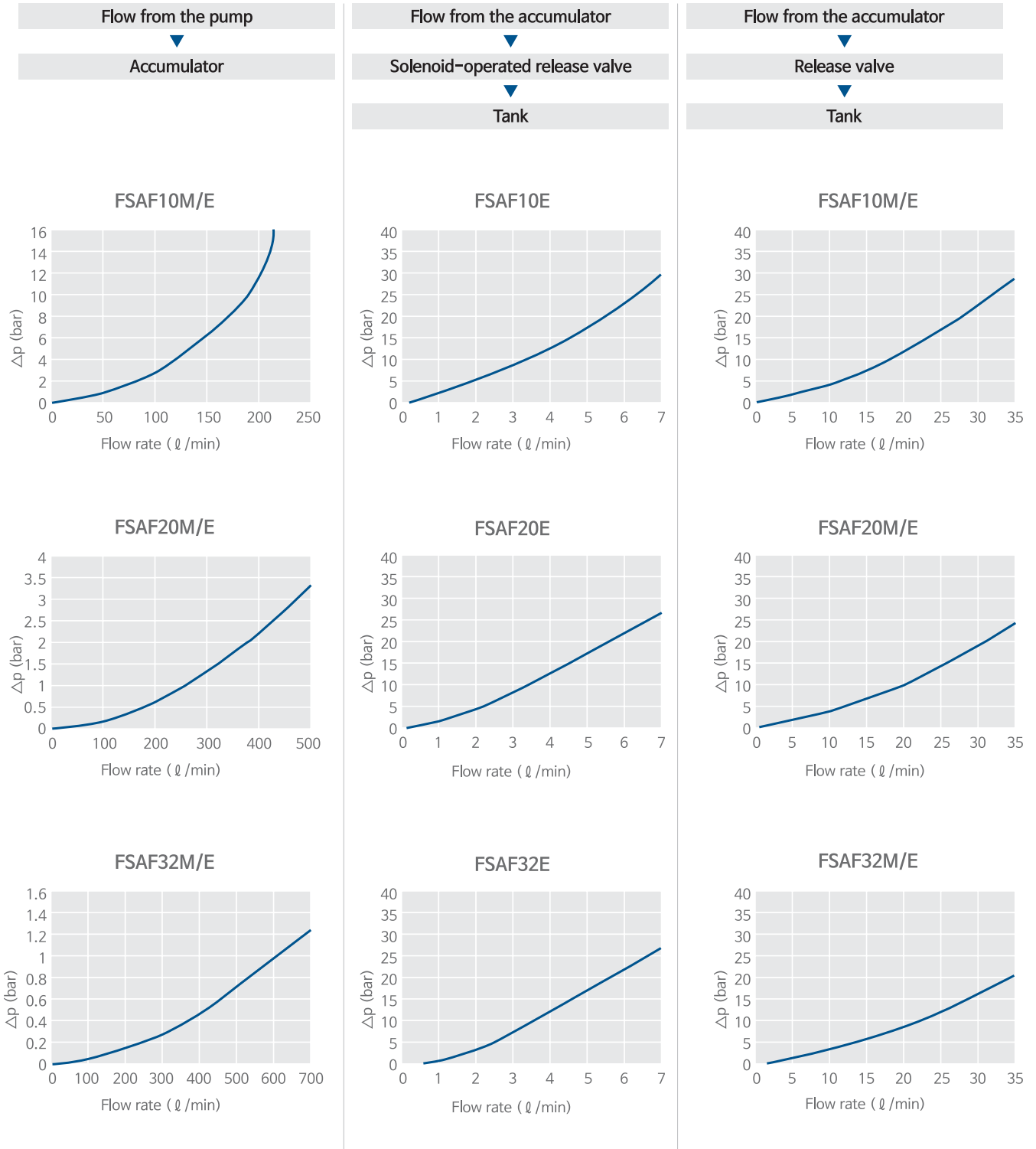
Type of discharge/Unloading way : E version
Sizes : FSAF10E, FSAF20E, FSAF32E

12. Safety & Shut-off Block(2)

3 FSAF Series (2)

GRAPHS FOR FSAF($\Delta P-Q$)

* Measured at: $v = 32 \text{ mm}^2/\text{s}$, $t_{\text{oil}} = 40 \text{ }^\circ\text{C}$, Operating pressure = 360 bar with pressure relief valve



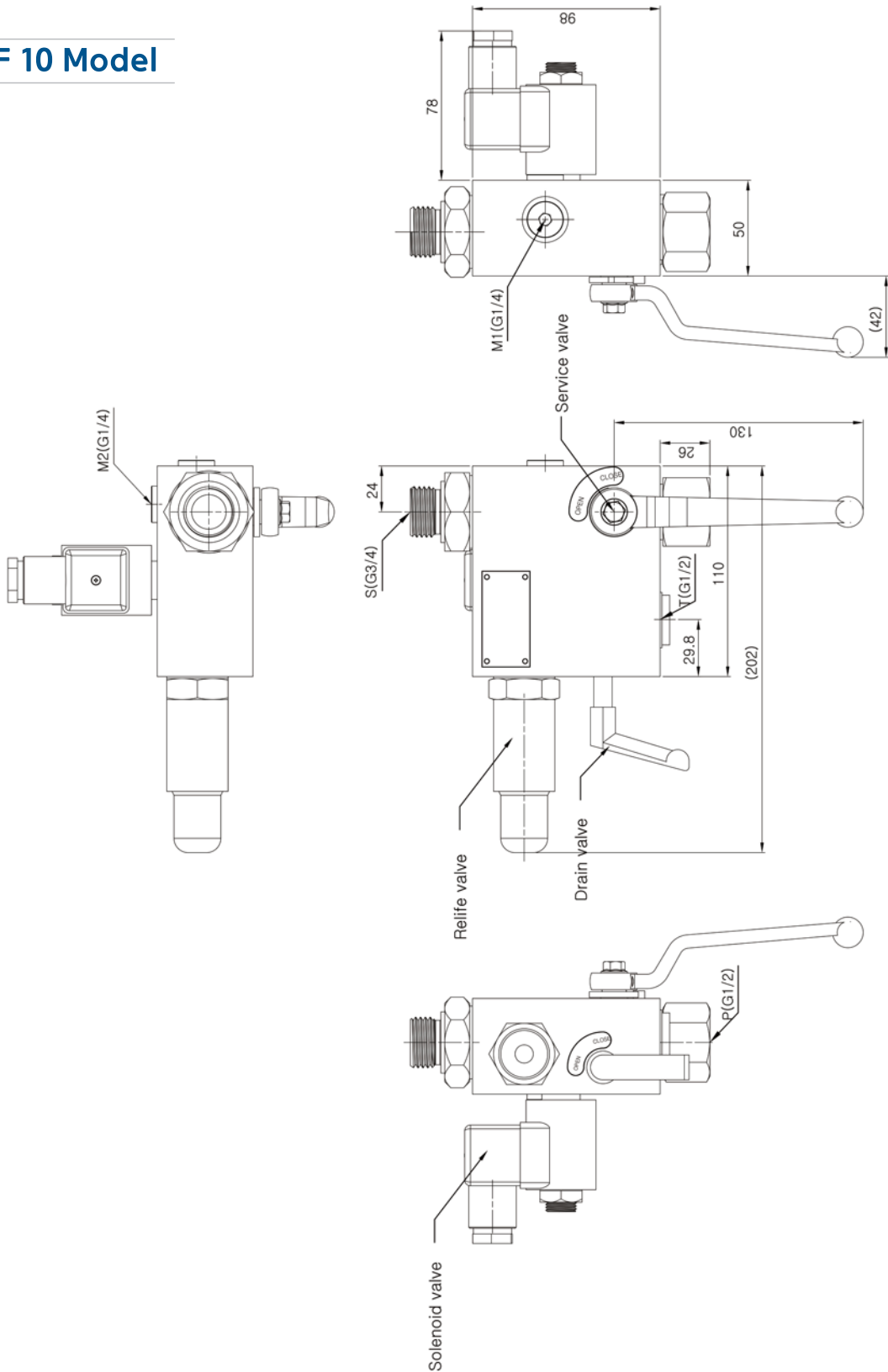


12. Safety & Shut-off Block(2)

4 FSAF Series (3)

The Exterior Dimensions

FSAF 10 Model

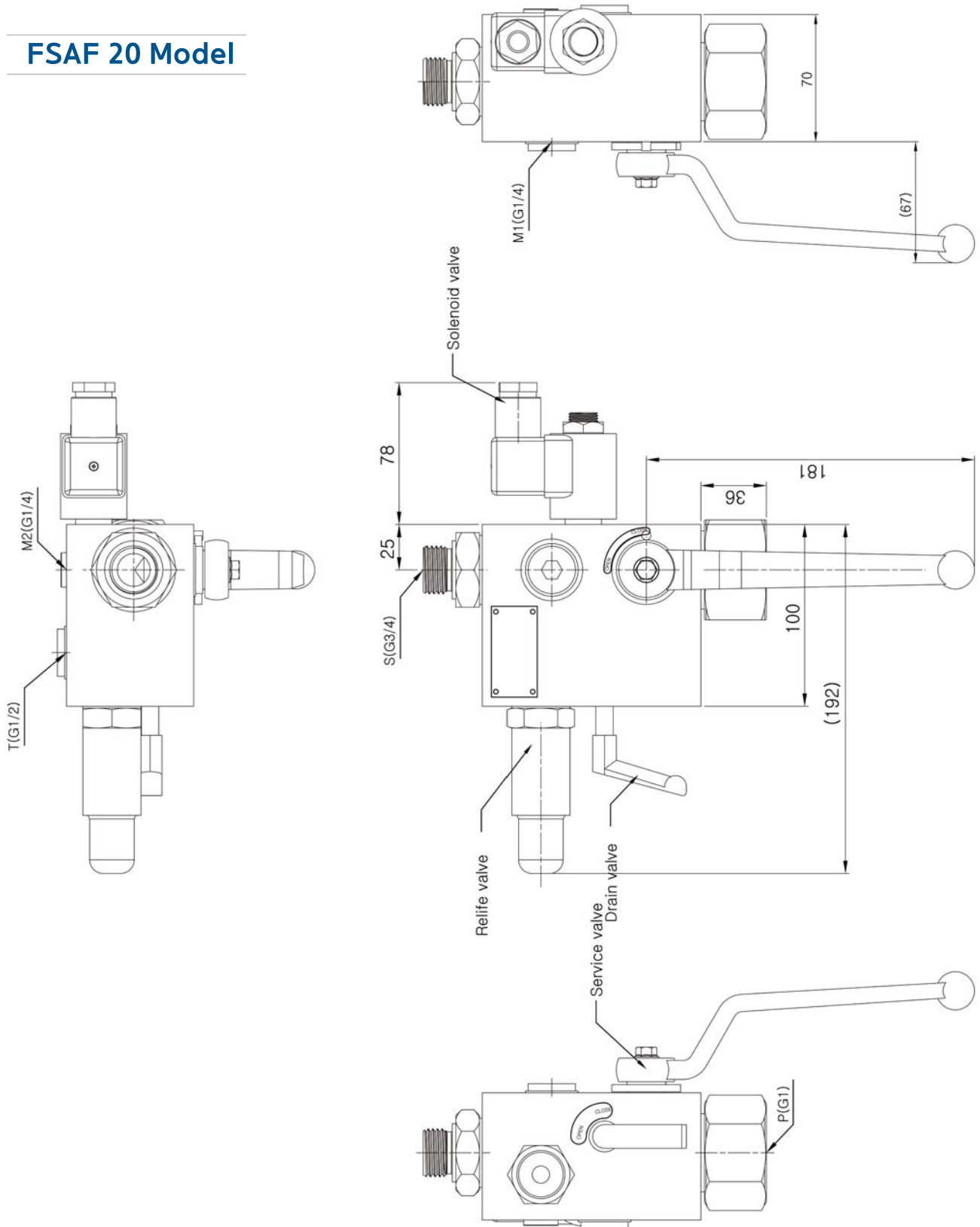


12. Safety & Shut-off Block(2)

4 FSAF Series (4)

The Exterior Demensions

FSAF 20 Model



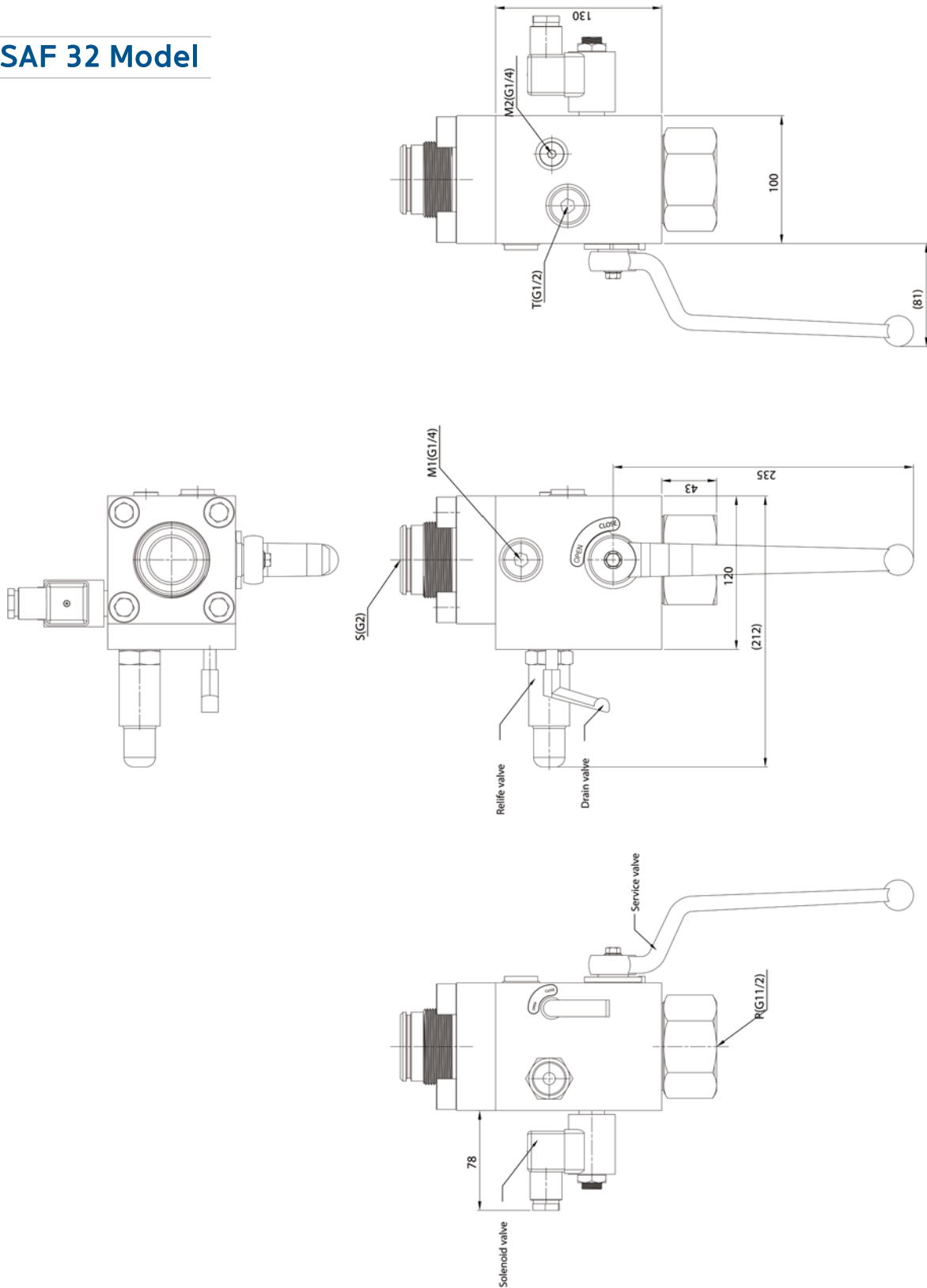


12. Safety & Shut-off Block(2)

4 FSAF Series (5)

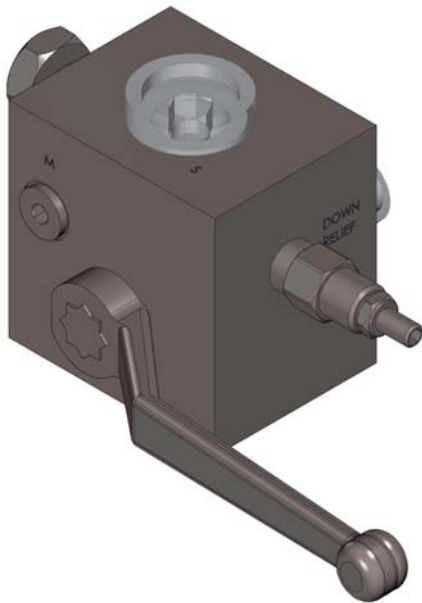
The Exterior Demensions

FSAF 32 Model



12. Safety & Shut-off Block(2)

1 FSV Series(1)



Basic Specification

- Working Pressure: 360bar(5,221psi)
- Temperature Range
 - Manual drain : -10°C ~ +80°C
 - Electrical drain : -10°C ~ +60°C
- Material
 - Body : Carbon Steel.
 - Sealing : Nitrile(Option - Viton)
- Electrical data
 - DC : 24V
 - AC : 110V or 220v, 50~60Hz
- Safety block comes with manual and electrical type.
- Please ensure to check the connecting size when assembling with accumulators.

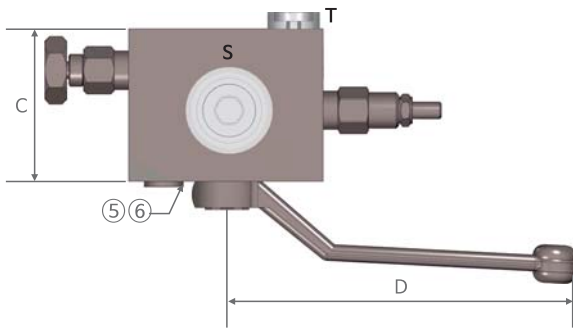
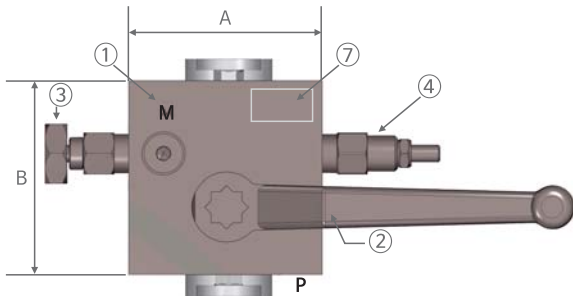
2 Ordering Code for Safety Block

1 FSV - **2** 12 - **3** 01 - **4** L - **5** N

1	2	3	4
Type (Series)	Model/Size	Relief Valve Type	Seal Material
FSV Safety Block	12 G1/2"	01 Manual	L Nitrile
<small>*Refer to page 46.</small>	20 G3/4"	02 Manual & Electrical	V Fluorocarbon
	30 G1"1/4		
5			
Voltage			
N	None		
G	DC 24V		
A	AC 110V		
B	AC 220V		

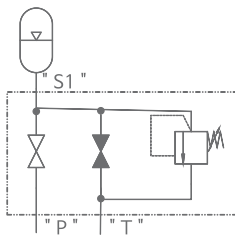
12. Safety & Shut-off Block(2)

3 FSV Series(2)

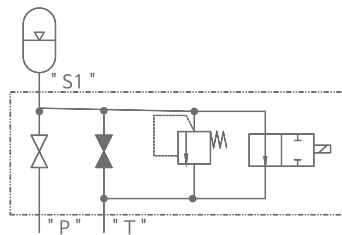


Part List

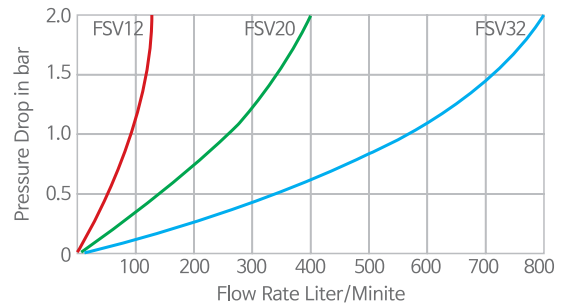
1	Safety Block Housing FSV Valve Assy Kit
2	Ball Valve Kit
3	Manual Pump Valve
4	Spring Relief Valve
5	Blanking Plug 1/4" BSP
6	Bonded Seal 1/4" BSP
7	Label



Type 1



Type 2



Pressure Drop / Flow Rate through Safety Block

Code	"S" port Accumulator	"P" port process	"T" port gauge	"M" port gauge	Dimension (mm)			
					A	B	C	D
FSV12	G1/2"	G1/2"	G1/4"	G1/4"	76	94	66	115
FSV20	G3/4"	G3/4"	G3/8"	G1/4"	89	89	70	160
FSV32	G1"1/4	G1"1/4	G3/8"	G1/4"	89	129	88	300