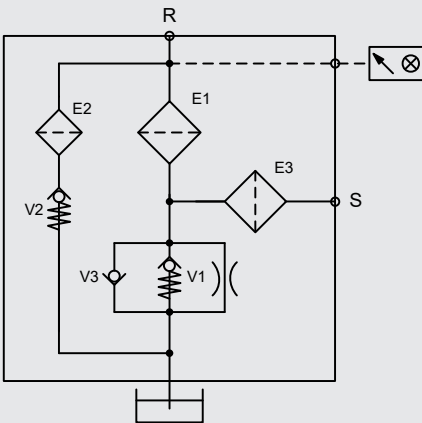


RKM Return line suction filter



Symbol for hydraulic systems:

Example RKM 407/807



- R: Return ports
- S: Suction ports
- V1: Back pressure valve
- V2: Bypass valve
- V3: Anti-cavitation valve
- E1: Filter element
- E2: Bypass strainer
- E3: Anti-cavitation strainer

1. SIZES

80	100	120	151	201	251	300	407	807

2. TECHNICAL DATA

Filter specifications

Nominal pressure	10 bar
Maximum flow rate	850 l/min
Temperature range	-30 °C to + 100 °C (short-term: -40 °C)
Material of filter head	Aluminium
Material of filter bowl	Steel (all RKM except RKM 300) Polyamide (RKM 300)
Material of cover plate	Polyamide (RKM 80 to 251) Aluminium (RKM 300 to 807)

Clogging indicators

Type	VMF – connection thread G 1/8"
Pressure setting	2.0 bar

Bypass

Cracking pressure (V2)	2.5 bar
Setting for back pressure valve (V1)	0.5 bar

Miscellaneous

Seal	NBR (= Perbunan)
Installation	Tank mounting filter
Special models and accessories	<ul style="list-style-type: none"> • with bleed valve • with multiport head (only RKM 80 to 251; see point 4.4) • with integrated thermal cooler bypass valve (only RKM 151 to 251; see point 4.5) • with anti-cavitation valve (V3) and anti-cavitation strainer (E3)
Spare parts	See section 8 - Spare parts
Certificates and approvals	on request

3. GENERAL DESCRIPTION

3.1 FILTER HOUSING

Design

The filter housings are designed in accordance with international regulations. They consist of a filter head, filter bowl and a screw-on or bolt-on cover plate.

Standard model

- with back pressure valve (V1)
- With bypass valve (V2)
- without anti-cavitation valve (V3)
- RKM 407 / 807: with anti-cavitation valve (V3) and pressure release valve, with bypass strainer (E2)

Application

RKM return line suction filters are ideally suited for use in equipment with two or more circuits. In particular, this filter is the "filter of choice" for mobile machinery with hydrostatic drives (wheel loaders, forklift trucks, harvesting machines). Ensure that the return line volume under operating conditions is always greater than the volume which is required on the suction side.

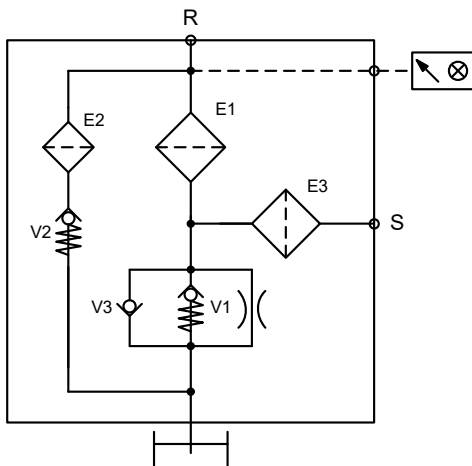
Mode of operation

The return line flow rate is supplied to the filter element (E1) via one or several inlets (R). After the fluid has passed through the filter element from the outside to inside (cleaning process), a pressure of 0.5 bar is applied inside the element by the back pressure valve (V1). This continuously supports the suction performance of pumps connected to the suction port (S), (e.g. boost pumps), especially in the case of cold starts. The risk of cavitation is significantly reduced. The excess flow which is not required at the suction port is then drained to the tank.

The bypass valve (V2) is fitted to relieve excessive back pressure. If the pressure becomes too high, the bypass valve enables a partial flow direct to the tank. In this case, a gradual rise in the valve performance curve ensures that the back pressure in the return lines is kept at a low level.

The sizes 407 and 807 are fitted with an additional strainer (E2) before the bypass as standard to enable coarse filtration of the return line flow.

With an optional anti-cavitation valve (V3), oil can be drawn from the tank for short periods, e.g. initial filling, venting after changing the element. In addition, the oil can be coarsely filtered via an optional anti-cavitation strainer (E3).



3.2 FILTER ELEMENTS

The filter elements used in RKM filters are notable for low back pressures, especially at high viscosities (e.g. cold starts).

They are validated and their quality is constantly monitored according to the following standards: ISO 2941, ISO 2942, ISO 2943, ISO 3724, ISO 3968, ISO 11170, ISO 16889.

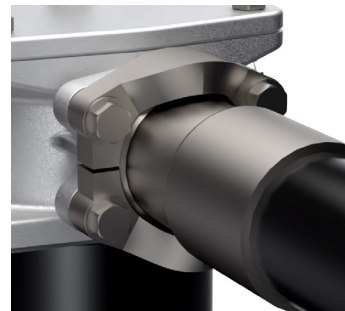
The elements are supplied with **pressure stability of 10 bar**.

3.3 COMPATIBILITY WITH OPERATING FLUIDS (ISO 2943)

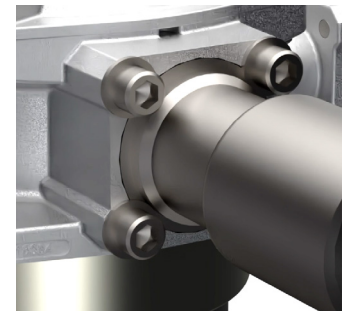
- Hydraulic oils HL to HVLP (DIN 51524)
- Lubrication oils (DIN 51517, API, ACEA, DIN 51515, ISO 6743)
- Compressor oils (DIN 51506)
- Biodegradable operating fluids: HETG, HEES, HEPG (VDMA 24568)
- Fire-resistant fluids HFA, HFB, HFC, HFD (ISO 12922)
- Operating fluids with a high water content (>50% water content) on request

3.4 CS CONNECTION

The RKM's very special cost saving (CS) connections are based on ISO 6162-1/-2 (SAE J518). They correspond to the sizes DN 32, DN 38 and DN 51. A flange head can be fastened to the housing directly. No flange halves are needed. This not only saves costs but also makes installation easier and faster.



Standard flange connection with flange halves



CS connection

3.5 NOTES

- The filter housings must be earthed e.g. via the system/pipe.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.
- In the filter mounting interface, the tank flange should have a maximum flatness of 0.3 mm and Ra 3.2 µm maximum roughness.

4. MODEL CODE

4.1 FILTER ASSEMBLY

RKM MM 300 B T F 10 W 0 . X /-NR

Filter type

RKM

Filter material

MM Mobilemicron®

Size of filter or element

80, **100**, 120, 151, **201**, 251, **300**, 407, **807**

Operating pressure

B 10 bar

V 7 bar (for RKM with clogging indicator up to max. 7 bar operating pressure)

Suction line port (P = preferred)

Type	Connection	Filter size								
		80	100	120	151	201	251	300	407	807
T	2 x CS 1 ¼"				●	●	●	P		
V	2 x G 1"				●	P	●			
X	1 x G 1"	●	P	●						
Z	to customer spec.	●	P	●	●	P	●			
0, 1	to customer spec.							●	P	

see point 4.4

see point 4.4

Return line port (P = preferred)

Type	Connection	Filter size								
		80	100	120	151	201	251	300	407	807
D	1 x G 1"	●	P	●						
E	1 x G 1 ¼"				●	P	●			
F	1 x CS 1 ½"							P		
Z	to customer spec.	●	P	●	●	P	●			
0...9	to customer spec.							●	P	

see point 4.4

see point 4.4

Filtration rating in µm

MM **10**, 15

Type of clogging indicator

W without port

F pressure switch

R back pressure gauge

Type code

0 no indicator

1, 2 see point 4.7

Modification number

X the latest version is always supplied

Supplementary details

NR with anti-cavitation valve (see point 4.6 / for 407/807 Standard → no supplementary details necessary)

NRF125 with anti-cavitation valve and coarse filter strainer (125 µm) (see point 4.6)

TH1 with thermal cooler bypass valve (see point 4.5)

xxxxx with multiport head (see point 4.4)

4.2 SPARE ELEMENT

0300 RK 010 MM

Size

0080, 0100, 0120, 0151, 0201, 0251, 0300, 0407, 0807

Type

RK

Filtration rating in µm

010, 015

Filter material

MM Mobilemicron®

4.3 CLOGGING INDICATOR

VME 2 E . X

Type

VMF connection thread G 1/8"

Pressure setting

2 2 bar

Type of clogging indicator

F pressure switch

R back pressure gauge

Modification number

X the latest version is always supplied

Note: Our preferred models are highlighted in colour.

4.4 MULTI-PORT HEAD

For the version with the multiport head (several ports in one head) in the case of the RKM 80-251, Z must be chosen in each of the "ports" sections in the model code and a five digit/letter code must be added in the supplementary details. For RKM 407-807, a combination of numbers is specified in the "ports" section.

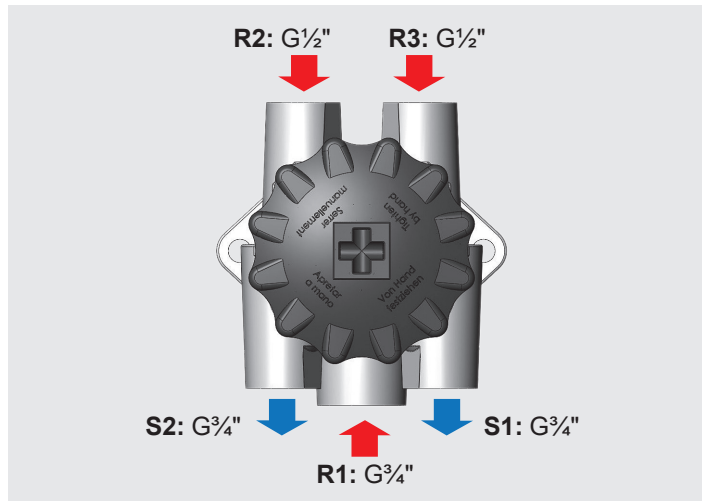
Examples:

- RKM 80 – 251: RKM MM 100 BZZ 10 W 1.0 /-CBBCC
- RKM 407 – 807: RKM MM 807 B03 10 W 1.0

The following port configurations are possible:

R = return port, S = suction port

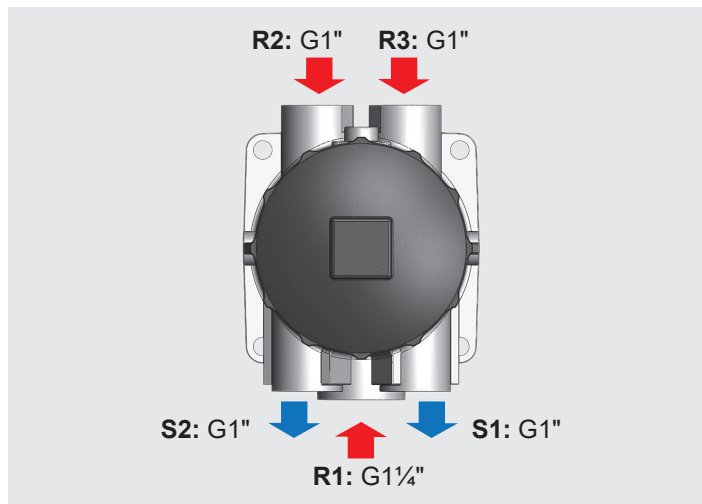
RKM 80, 100, 120



Model code: ... BZZ .../-CBBCC

Example: RKM MM 80 BZZ 10 W 1.0 /-CBBCC

RKM 151, 201, 251



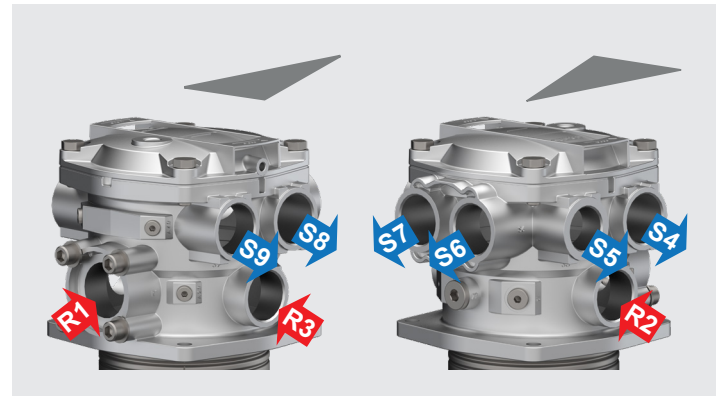
Model code: ... BZZ .../-EDDDD

Example: RKM MM 151 BZZ 10 W 1.0 /-EDDDD

RKM 407, 807

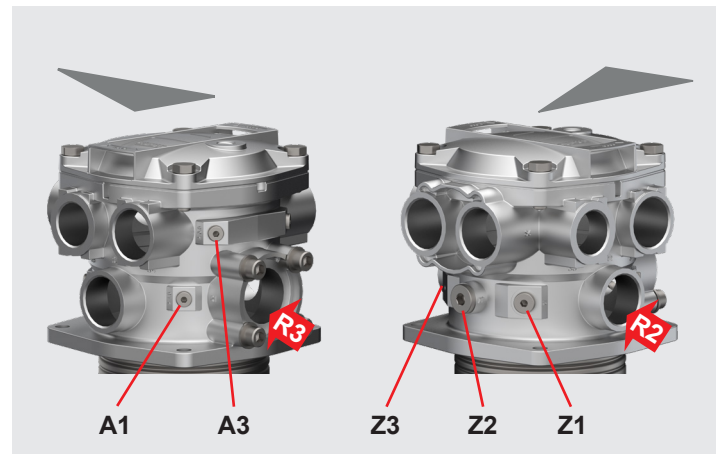
For the sizes 407 and 807, four different port options are possible. These are represented by a two digit code.

Port configuration RKM 407, 807



CODE	R1	R2	R3	S4	S5	S6	S7	S8	S9
01	CS2"	G 1	G 1 1/2	G 1	G 1	G 1 1/4	G 1 1/4	-	-
03	CS2"	G 1 1/2	G 1	G 1	G 1	G 1	G 1	G 1	G 1
07	CS2"	G 1 1/2	G 1 1/2	G 1 1/2	G 1 1/2	G 1 1/2	G 1 1/2	G 1 1/2	G 1 1/2
10	CS2"	G 1 1/2	G 1 1/2	G 1 1/4	G 1 1/2	CS2"		G 1 1/2	G 1 1/4

Connection for clogging indicator / additional connection

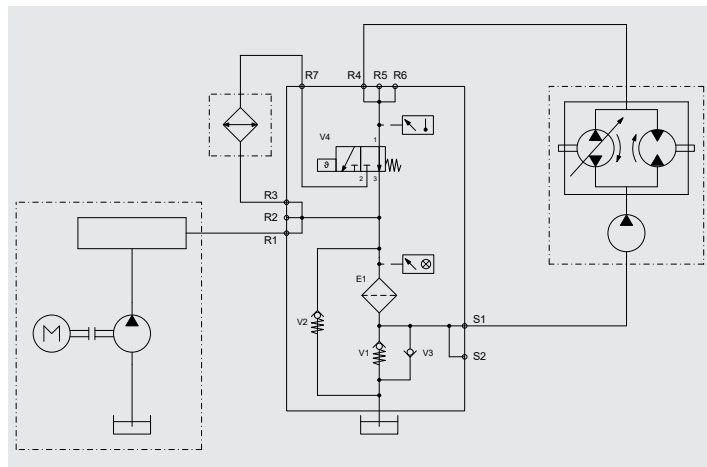
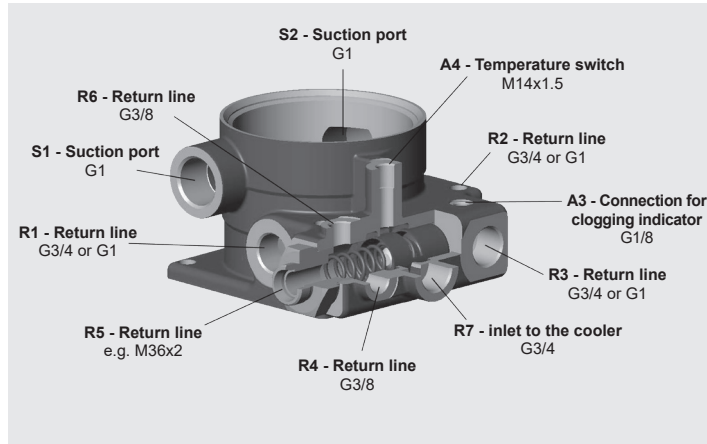


CODE	A1	A3	Z1	Z2	Z3
01	-	-	G 1/2	-	-
03	G 1/8	G 1/8	-	G 1/2	-
07	G 1/8	-	-	-	-
10	G 1/8	-	M14 x 1.5	G 1/2	M18 x 1.5

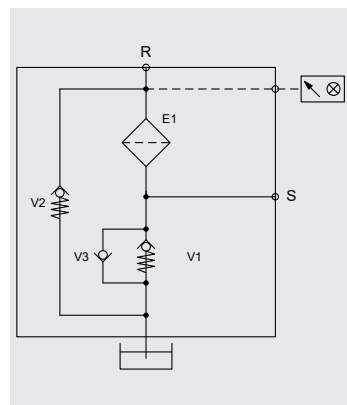
4.5 THERMAL COOLER BYPASS VALVE

In the version with the integrated thermal valve, the partial flow which requires cooling is directed via separate ports via the valve. The position of the spool is regulated by the oil temperature. During a cold start, the spool shuts off the flow to the cooler. If the oil warms up, the valve opens so that a partial flow flows through the cooling circuit. From approx. 50-60 °C the inlet to the cooler is completely open.

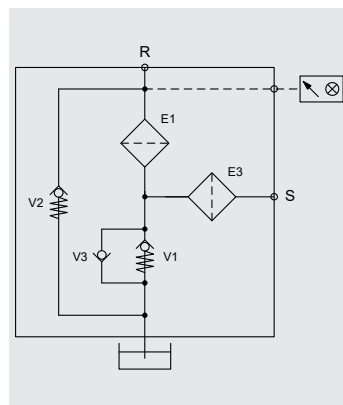
The connection configuration is determined by agreement with the customer.



4.6 SYMBOLS FOR OPTIONAL ADDITIONS



Anti-cavitation valve
/-NR
Standard for RKM 407/807

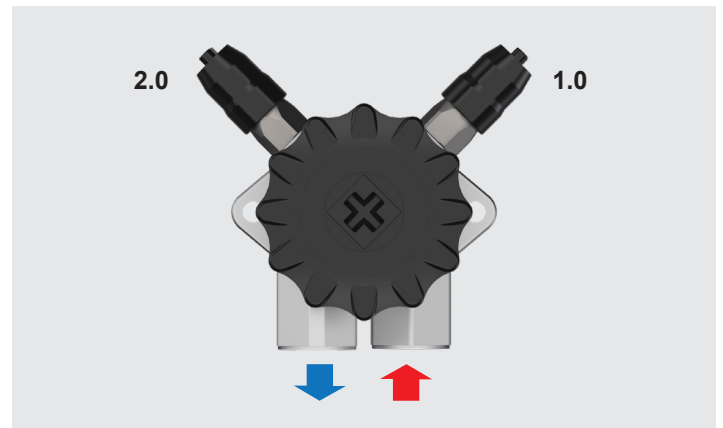


Anti-cavitation valve and coarse filter strainer
/-NRF125

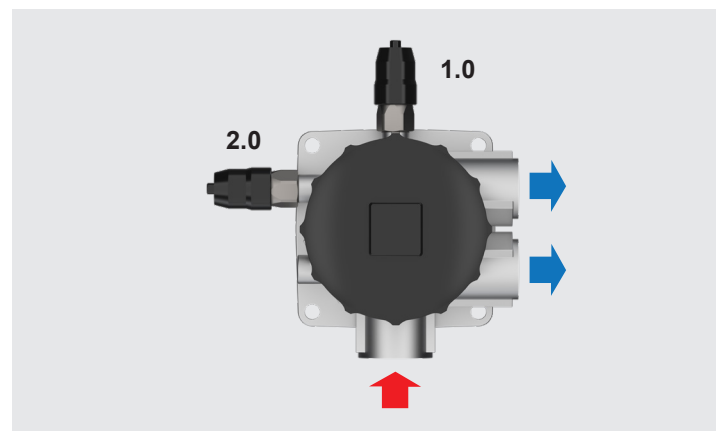
4.7 TYPE CODE

The type code indicates the installation position of the clogging indicator:

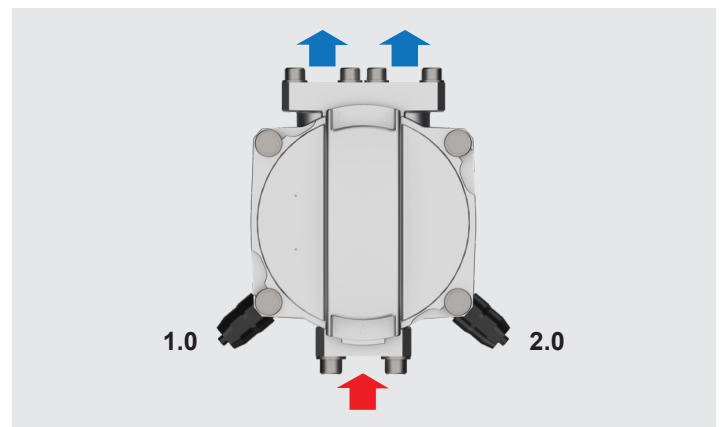
RKM 80, 100, 120



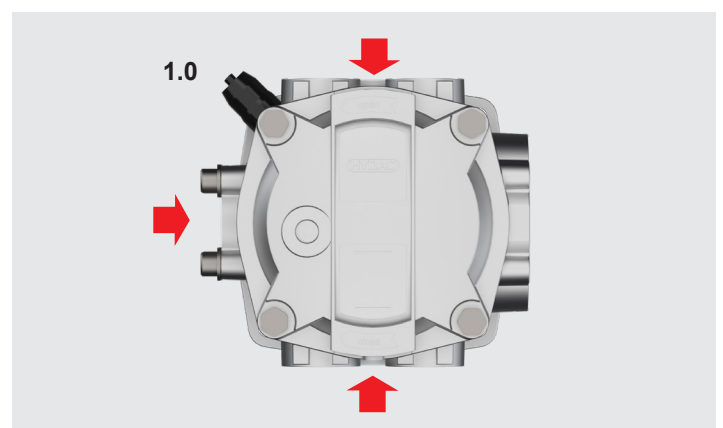
RKM 151, 201, 251



RKM 300



RKM 407, 807



5. FILTER CALCULATION

The total pressure drop of a filter at a particular **flow rate Q** and a **viscosity v** consists of the sum of the housing pressure drop and the element differential pressure.

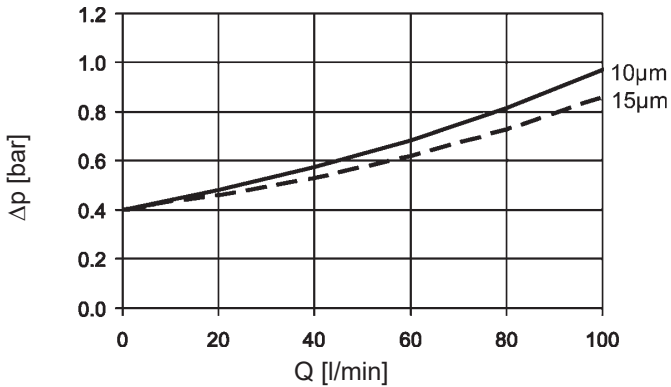
For ease of calculation, our Filter Sizing Program is available free of charge at:

www.hydac.com/en/online-tools

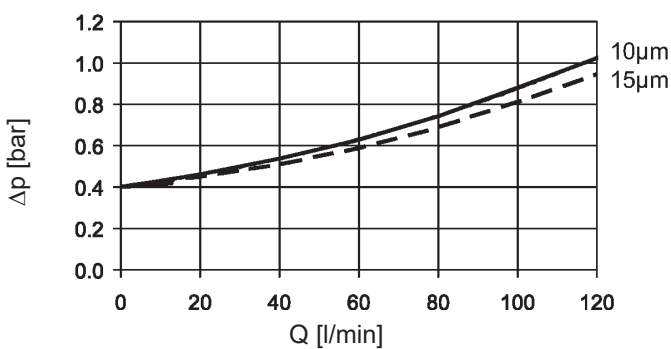
5.1 DIFFERENTIAL PRESSURE PERFORMANCE CURVES

The housing curves apply to mineral oil with a density of 0.86 kg/dm^3 and a kinematic viscosity of $30 \text{ mm}^2/\text{s}$. In this case, the differential pressure changes proportionally to the density.

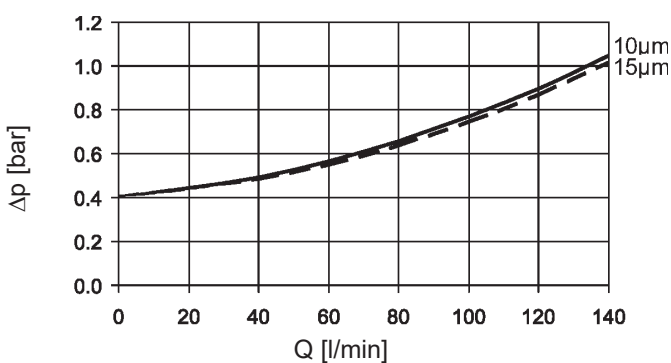
RKM 80



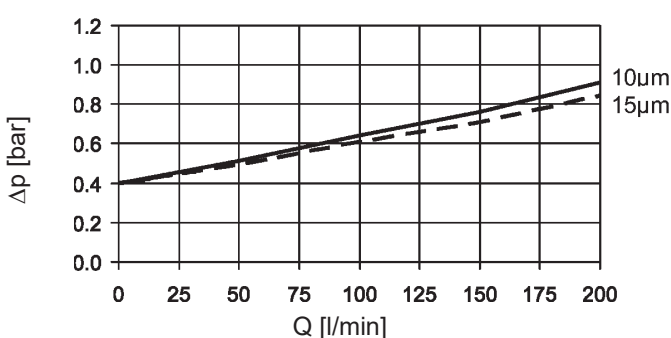
RKM 100



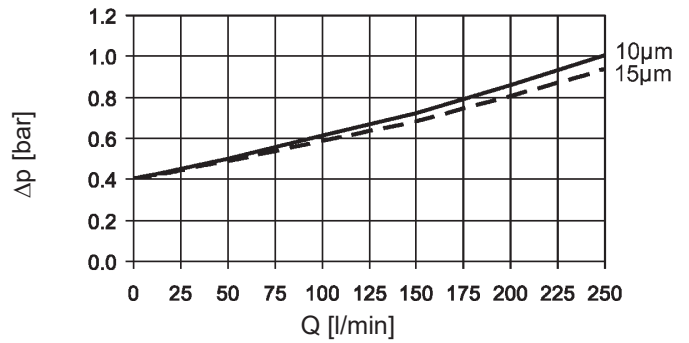
RKM 120



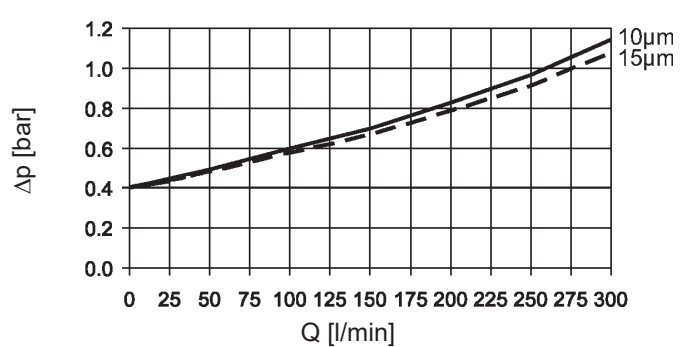
RKM 151



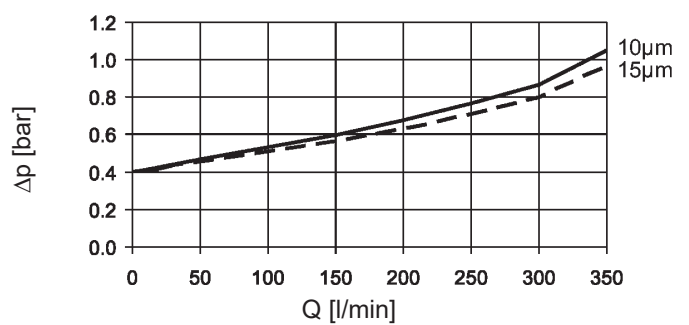
RKM 201



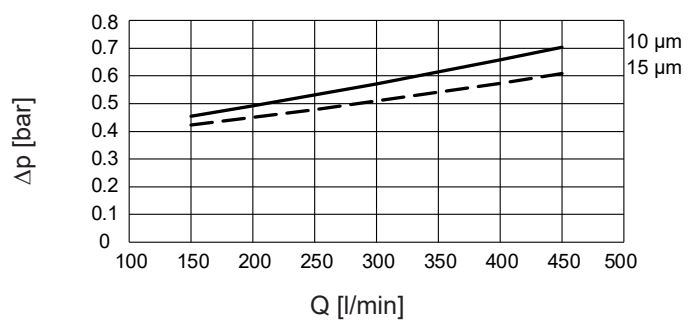
RKM 251



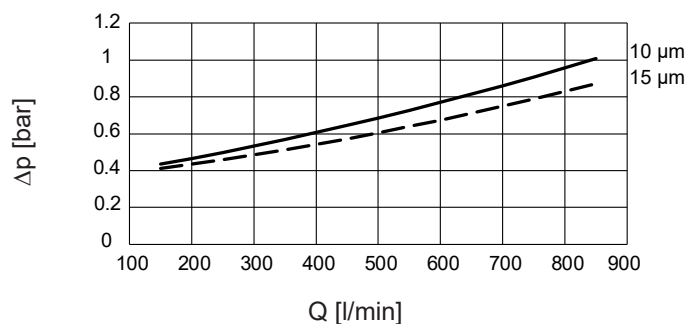
RKM 300



RKM 407



RKM 807



5.2 MAXIMUM FLOW RATE

The following maximum permitted flow rates (Q_{\max}) are possible for the various sizes and connection sizes in l/min:

Size	Connector		Q_{\max} [l/min]
	Suction	Return	
80	X	D	100
100	X	D	140
120	X	D	160
151	T, V	E	200
201	T	E	290
	V	E	280
251	T	E	330
	V	E	320
300	T	F	400
407	Z	Z	700
807	Z	Z	850

Information regarding dimensioning:

The hydraulic load on the filter element is primarily determined by the flow rate and the geometry of the particular filter element. Exceeding the maximum permitted flow rate (Q_{\max}) and therefore the permitted hydraulic load can destroy the filter element.

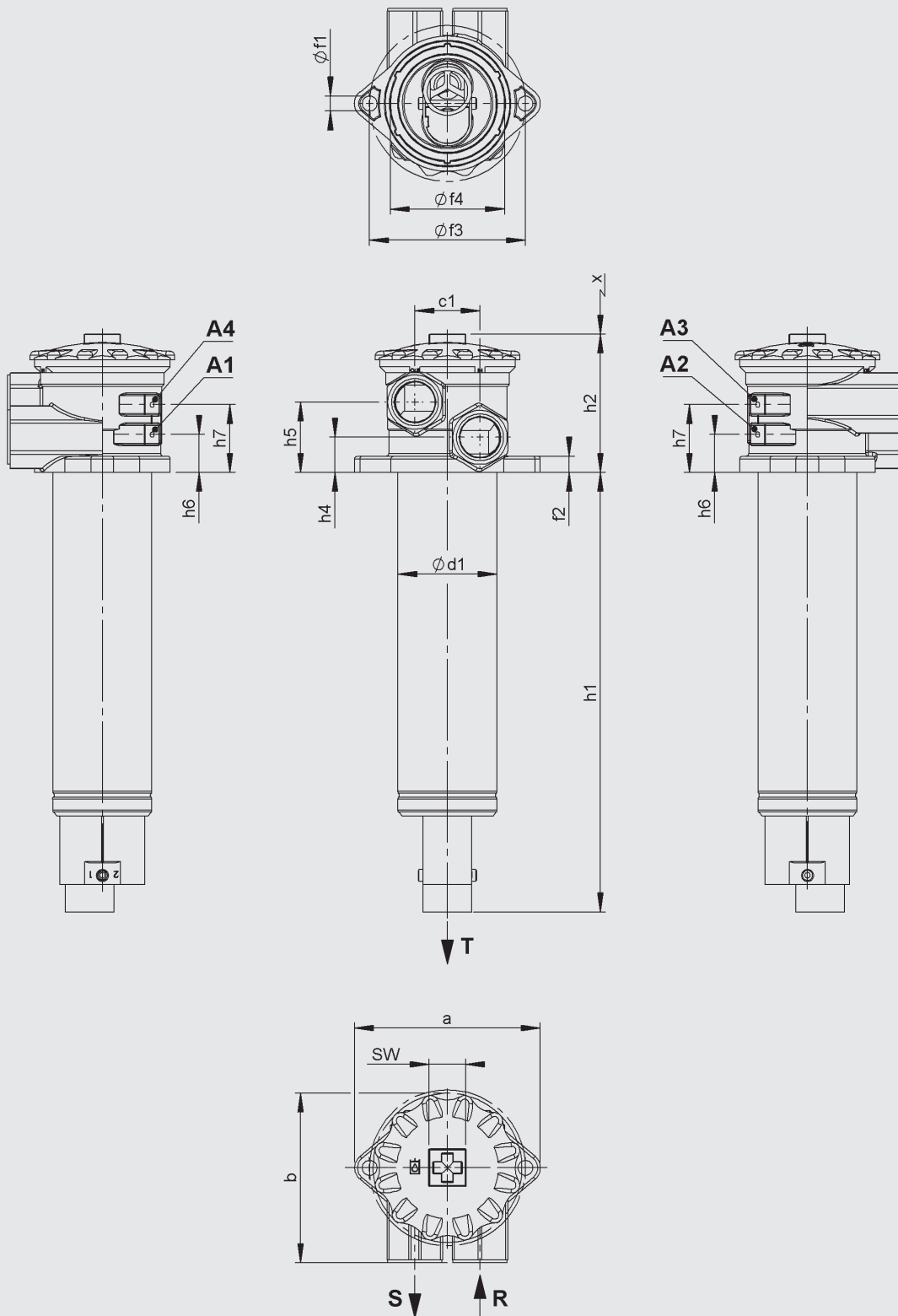
Even the choice of operating medium can influence system performance and lead to problems during use such as electrostatic discharges.

Adherence to the maximum permitted flow rate should always be ensured throughout the system project planning process.

If you have any questions regarding dimensioning or project planning, please contact the technical sales department at HYDAC Filbertechnik.

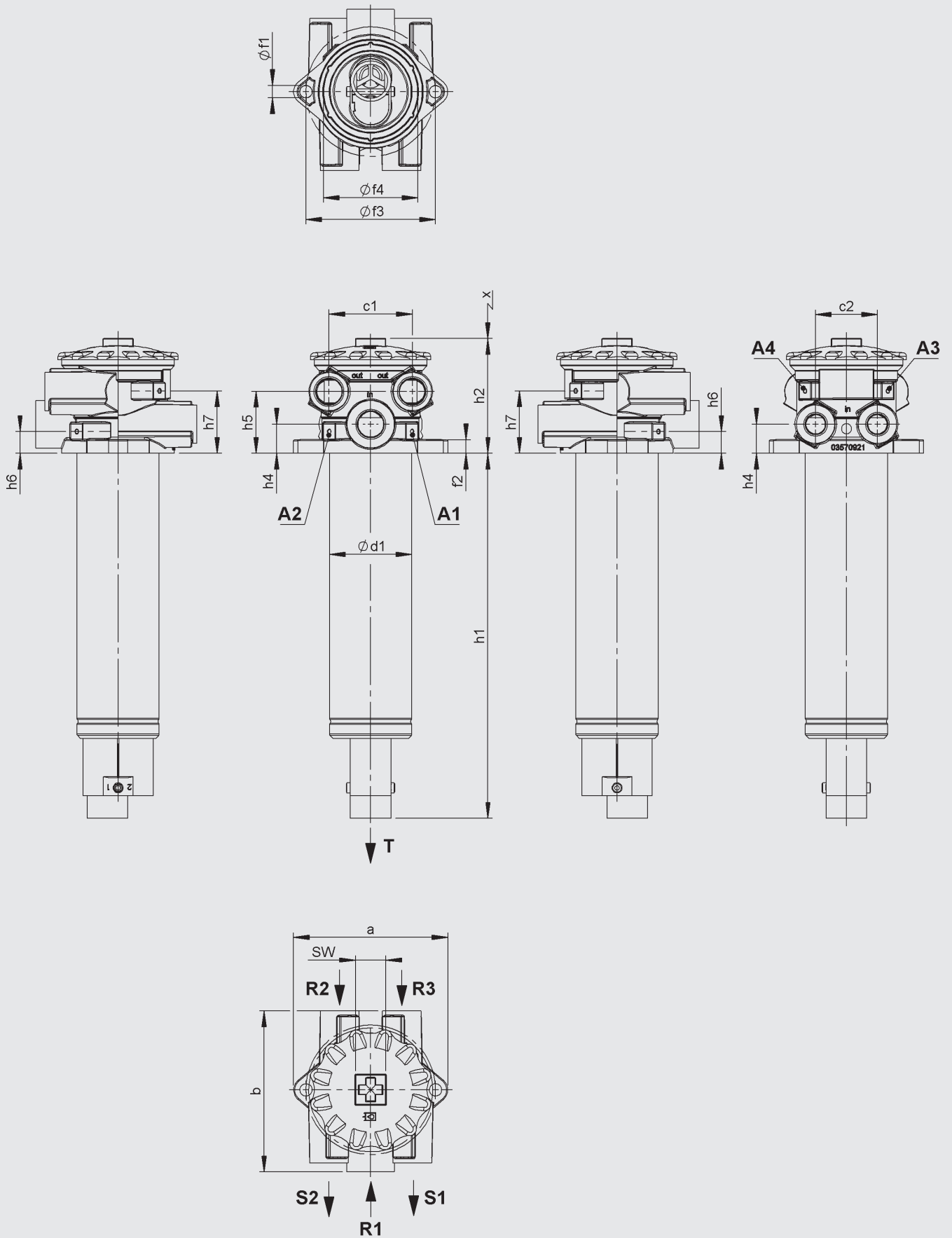
6. DIMENSIONS

RKM 80, 100, 120

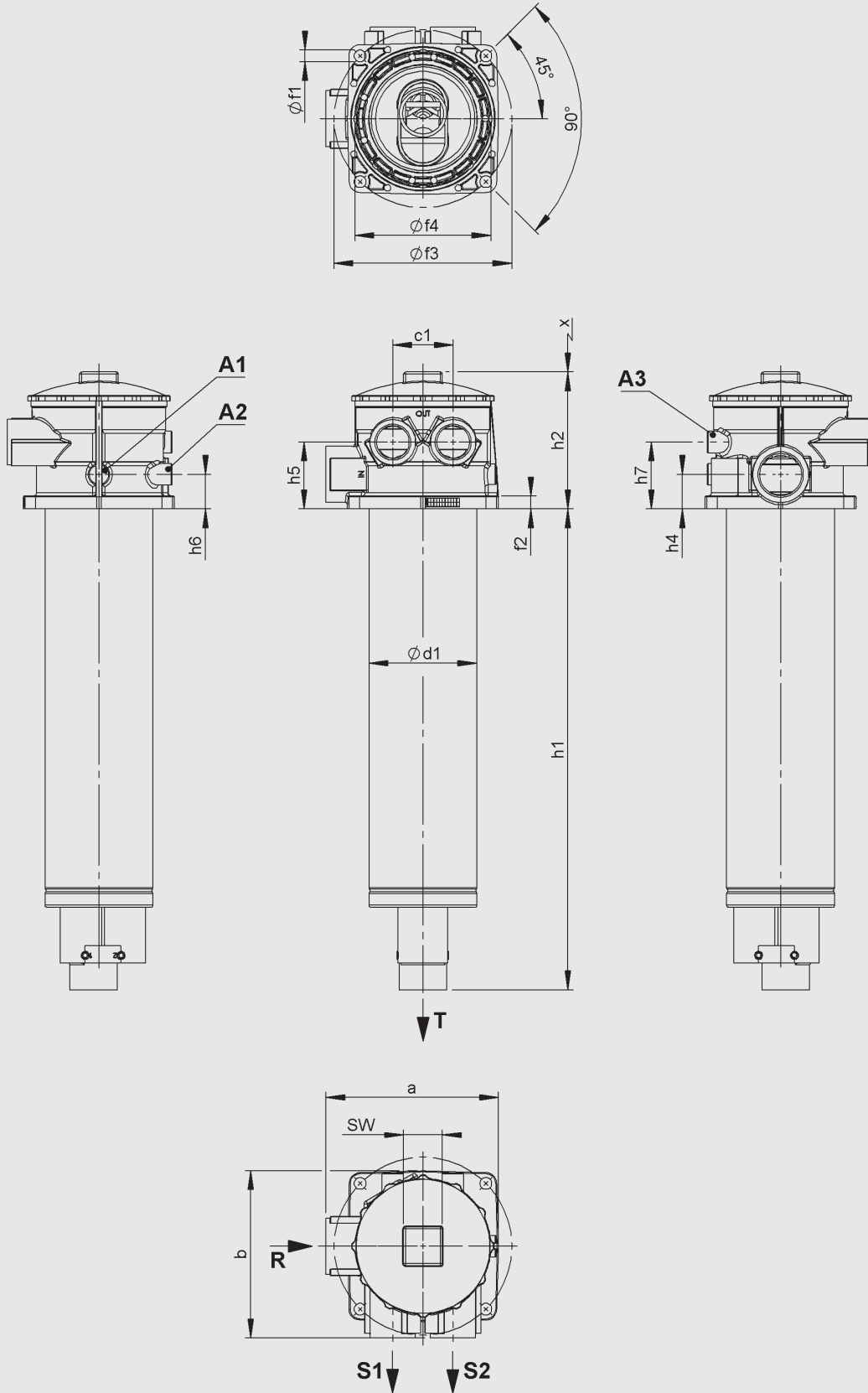


Size	a	b	c1	$\phi d1$	$\phi f1$	f2	$\phi f3$	$\phi f4$	h1	h2	h4	h5	h6	h7	AF	x	Weight [kg]	Content [l]
80	137	125	48	73	11	12	115	84.4	208	54	102	26	52	28	50	290	1.5	0.8
269									1.7								1.0	
324									1.9								1.2	

RKM 80, 100, 120 Multiport

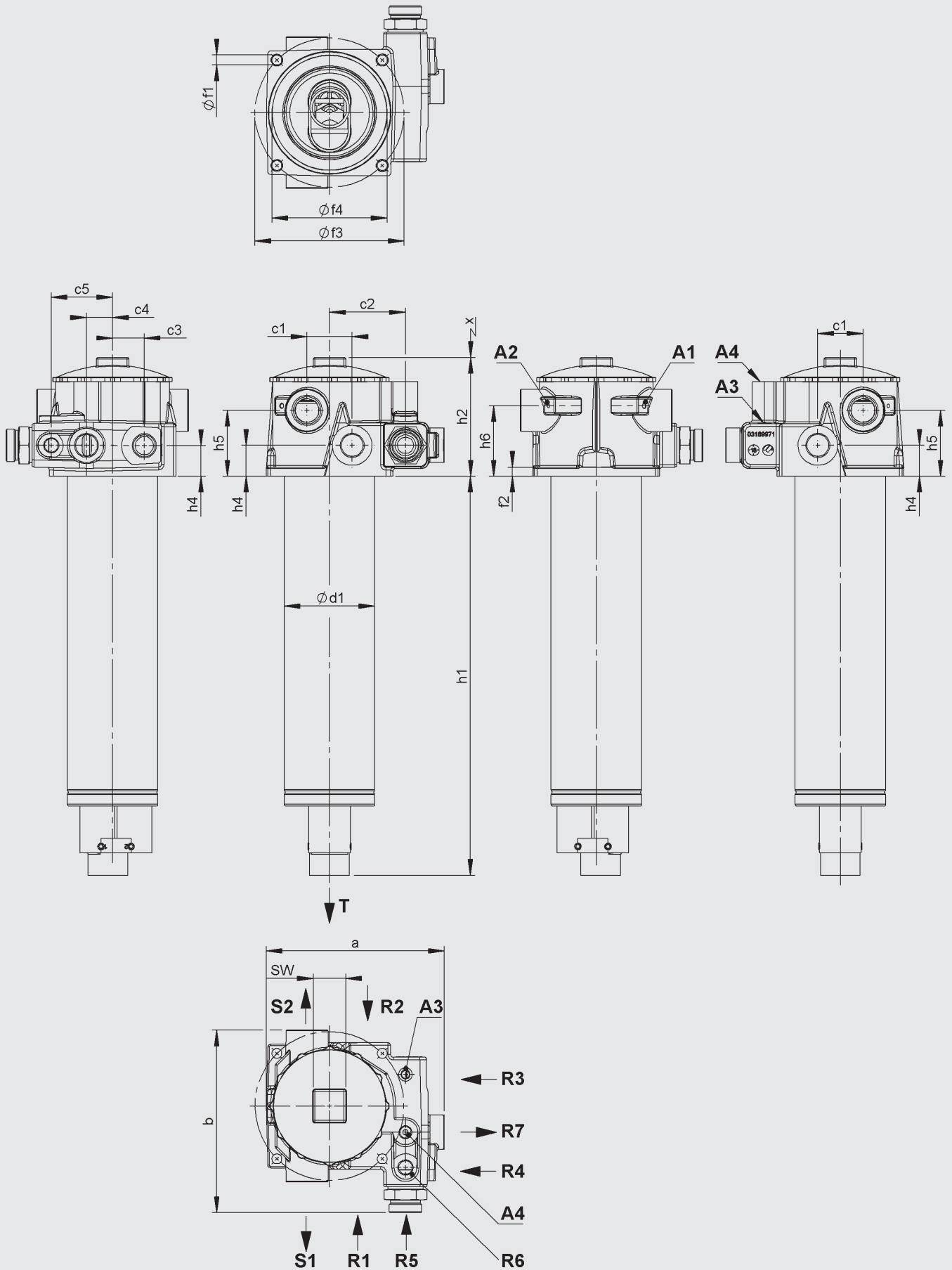


Size	a	b	c1	c2	Ø d1	Ø f1	f2	Ø f3	Ø f4	h1	h2	h4	h5	h6	h7	AF	x	Weight [kg]	Content [l]
80										208							290	1.8	0.8
100	137	143	74	55	73	11	12	115	83.9	269	102	26	55	19.5	55.5	27	350	2.0	1.0
120										324							405	2.2	1.2



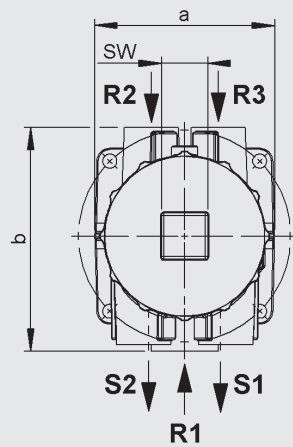
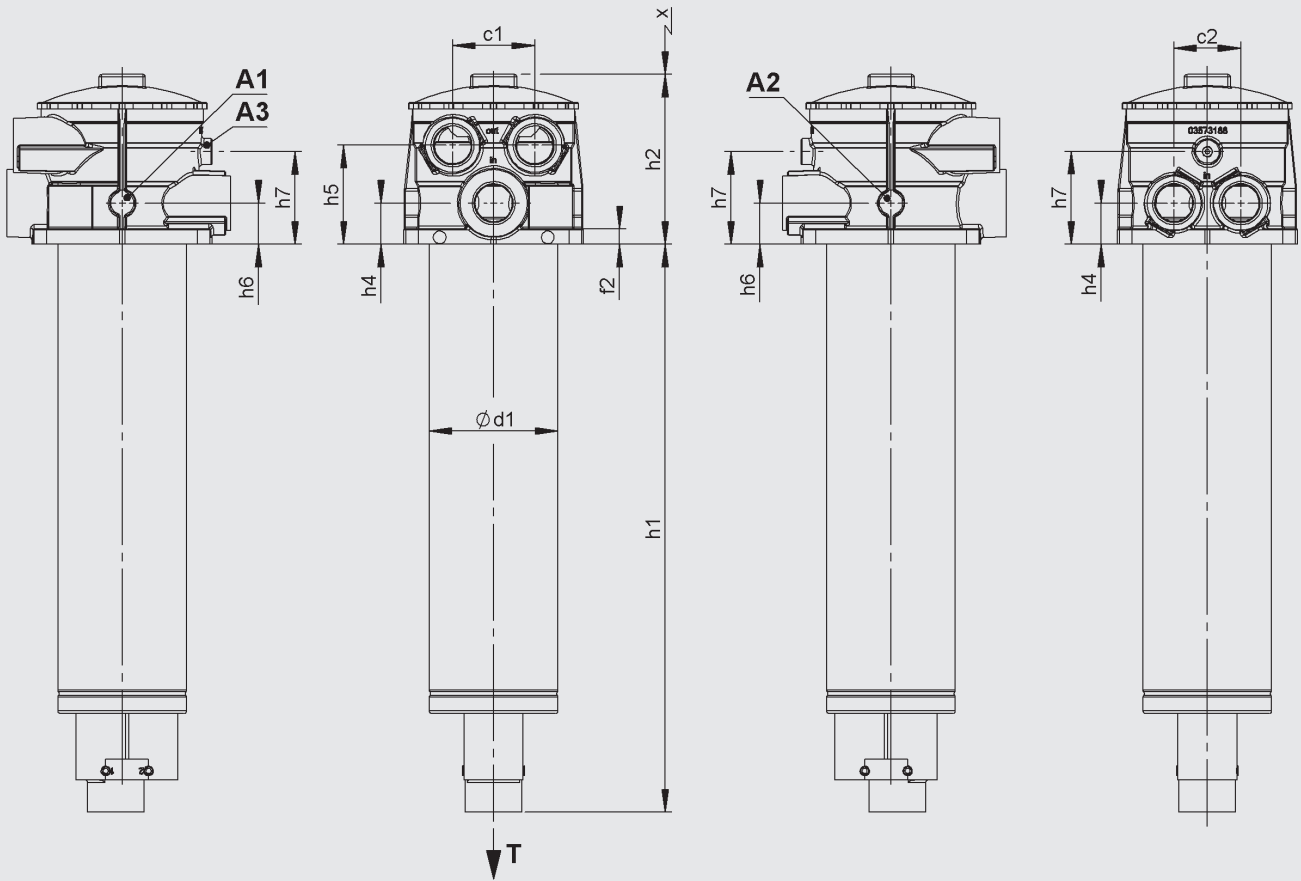
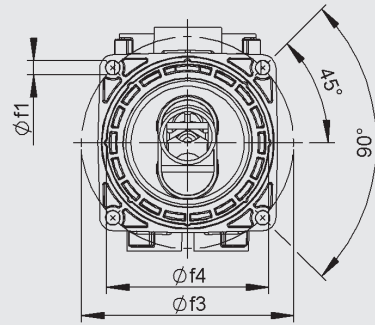
Size	a	b	c1	$\phi d1$	$\phi f1$	f2	$\phi f3$	$\phi f4$	h1	h2	h4	h5	h6	h7	AF	x	Weight [kg]	Content [l]
151	160	155	56	100	11	12	165	126	272	127	32	62	32	62	36	375	3.1	2.2
201									379							480	3.7	2.5
251									446							550	4.0	3.0

RKM 151, 201, 251 /-TH

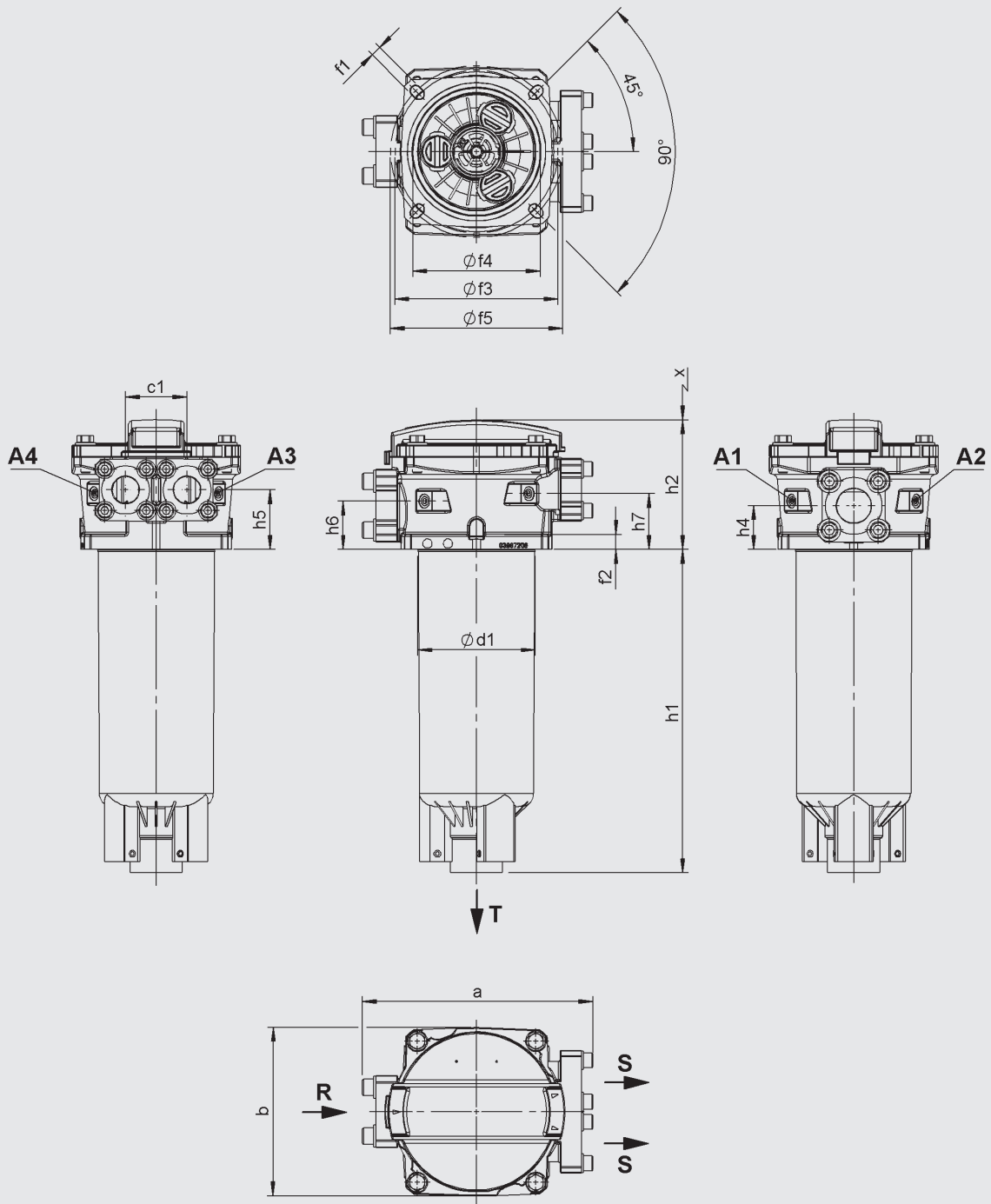


Size	a	b	c1	c2	c3	c4	c5	Ø d1	Ø f1	f2	Ø f3	Ø f4	h1	h2	h4	h5	h6	AF	x	Weight [kg]	Content [l]	
151													268							375	4.6	2.2
201	197	202	50	84	35	29	68	100	11	10	165	126	375	132	34	73	78	36		480	5.2	2.5
251													442							550	5.5	3.0

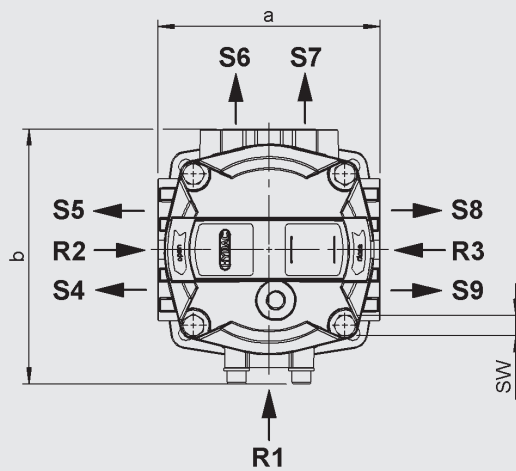
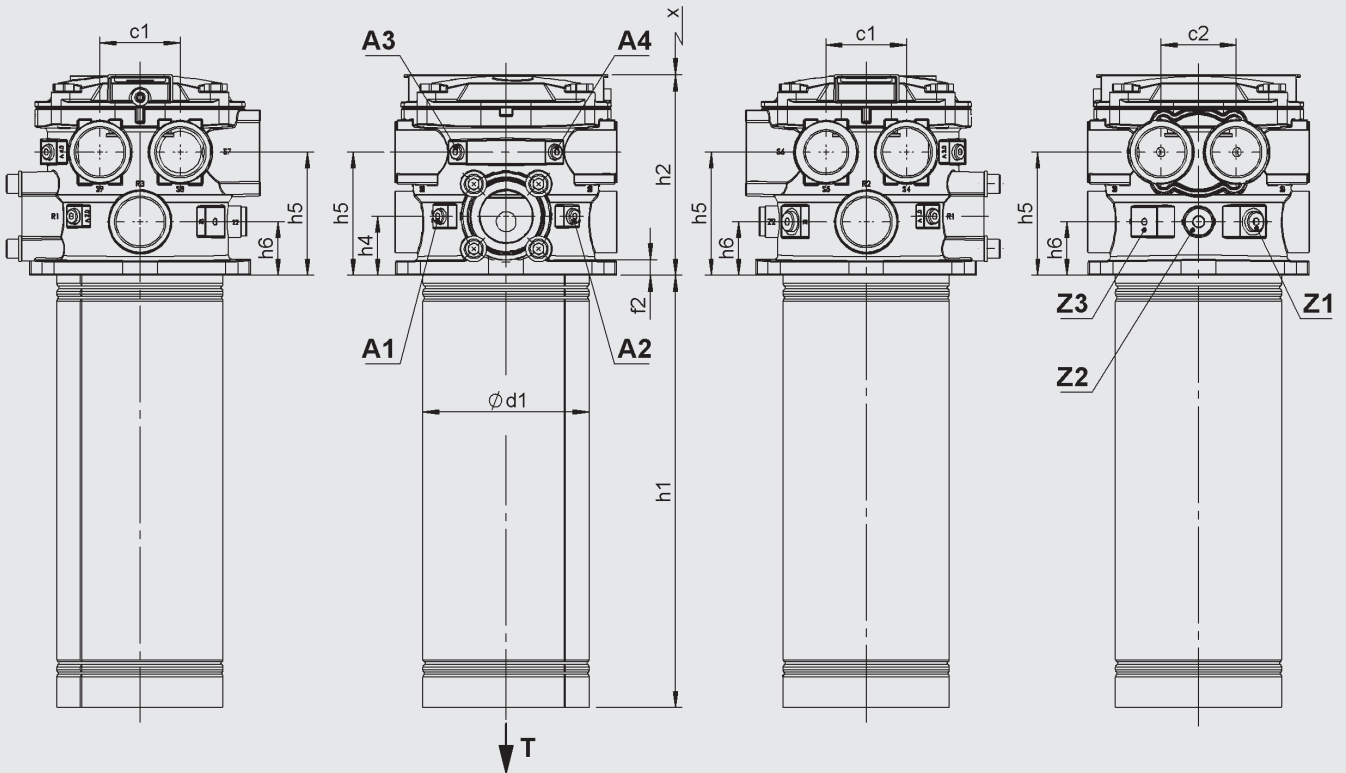
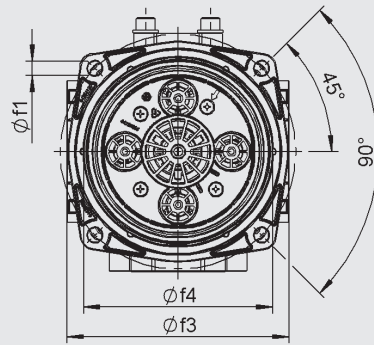
RKM 151, 201, 251 Multiport



Size	a	b	c1	c2	Ø d1	Ø f1	f2	Ø f3	Ø f4	h1	h2	h4	h5	h6	h7	AF	x	Weight [kg]	Content [l]
151	140	175	64	52	100	11	12	165	126	268	132	32	77	32	72	36	375	3.5	2.2
201										375								4.2	2.5
251										442								4.5	3.0



Size	a	b	c1	$\varnothing d_1$	f1	f2	$\varnothing f_3$	$\varnothing f_4$	$\varnothing f_5$	h1	h2	h4	h5	h6	h7	x	Weight [kg]	Content [l]
300	247	181	66	126	11	16	175	136.5	185	347	139	47	64	52	60	500	4.6	4.0



Size	a	b	c1	c2	Ø d1	Ø f1	f2	Ø f3	Ø f4	h1	h2	h4	h5	h6	AF	x	Weight	Content
																	[kg]	[l]
407	207	238	75	70	155	13.5	14	220	177	324	187	55	115	50	19	420	8.8	8.5
807										404							500	11.0

NOTES

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.

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