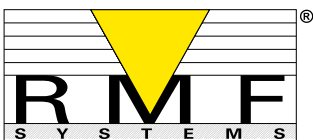


RMF SYSTEMS

PURE POWER



AIR CONDITIONER DESICCANT BREATHING



Benefits RMF 'Air conditioner'

- ▶ Reducing water contamination level prolongs the life of the additive package and reduces oxidation of the oil and bearing surfaces.
- ▶ Eliminates rusting due to condensation.
- ▶ Reduces machine downtime.
- ▶ Extends the machine's useful life.
- ▶ Reduces cost of ownership.

Air conditioners

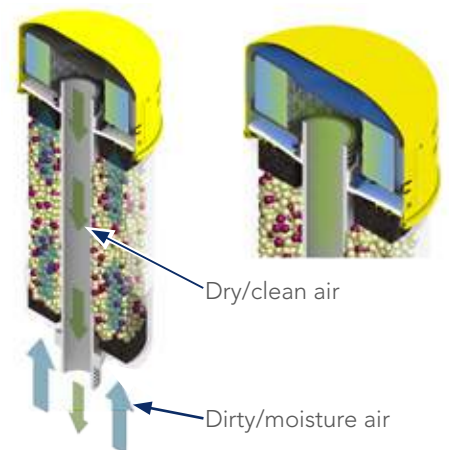
CONDENSATION IN RESERVOIRS

HYDRAULIC AND LUBRICATING OILS MUST BE KEPT FREE FROM CONTAMINATION AND WATER. MOST FLUID RESERVOIRS MUST BE ABLE TO BREATHE, THUS ALLOWING WATER VAPOUR AND SOLID CONTAMINANTS TO ENTER. TEMPERATURE FLUCTUATIONS IN THE RESERVOIR WILL CAUSE THIS WATER VAPOUR TO CONDENSE WHICH WILL NOT ONLY CAUSE OXIDATION OF THE OIL, BUT CAN ALSO LEAD TO CONSIDERABLE MECHANICAL DAMAGE.

FILTRATION AND DRYING A SINGLE PROCESS

Standard air breathers remove some of the solid particles but allow water vapour in the air to pass freely. The RMF 'Air conditioner' deals effectively with both so reservoirs can breath clean, dry air. The air is first dried by passage through a column packed with ZR gel granules. The dried air is then passed through a pleated synthetic fibre filter element (replaceable spin-on type) where solid particles are removed,

so that the air reaching the reservoir is both clean and dry.





MONITORING

The uptake of moisture can be observed by the change in colour of the indicator granules in the ZR gel. They turn from ruby-red (active) to light orange (replace). The ZR gel granules are completely replaceable, non toxic and non carcinogenic. An optional contamination indicator shows when the air filter is in need of replacement.

ACTIVE COAL

RMF 'Air conditioners' can be fitted with a combination of ZR gel and active coal, the active coal will eliminate oil vapour and the smell, it will also prevent the ZR gel from being contaminated with this oil damp.



ACTIVE



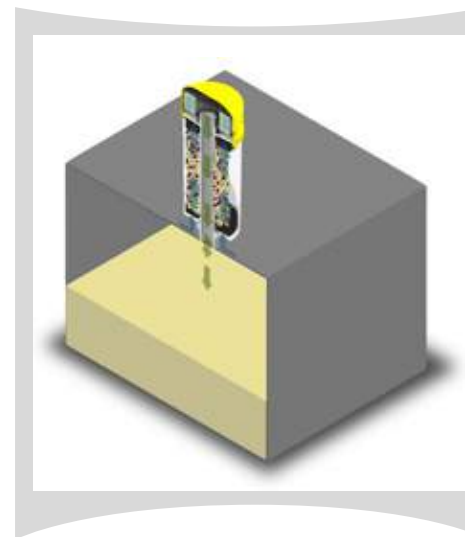
REPLACE

ATMOSPHERICALLY CLOSED

The RMF range also offers some 'Air conditioners' for gearbox applications which have spring loaded (0.01 bar) check valves fitted in the base in opposing directions, opening only whilst inhaling or exhaling. This way there is no atmospheric contact with the air and the ZR gel under static conditions increasing the lifetime of the drying agent.

APPLICATIONS

RMF 'Air conditioners' can be used on hydraulic power units, lube and oil tanks, gearboxes, diesel fuel tanks and storage tanks for biodegradable fluids. Industries that are successfully applying 'Air conditioners' include: steel industry, aviation industry, forestry industry, pulp & paper industry, cement industry, petrochemical industry and mining industry.



Air Conditioners Accessoires

BENEFITS RMF OIL-DEMISTERS

- ▶ Reduces premature filter exchange
- ▶ Reduces fluid spills on machine surfaces
- ▶ Reduces environmental risks
- ▶ Reduces fluid waste
- ▶ Reduces safety issues with oil spills
- ▶ Reduces cost of ownership

WHERE CAN IT BE USED

RMF Oil-Demisters can be used on:

- ▶ Hydraulic power units
- ▶ Lube and oil tanks
- ▶ Gearboxes
- ▶ Pump vents
- ▶ Pulp Refiners

OIL-DEMISTERS

THE RMF SYSTEMS OIL-DEMISTERS ARE SPECIALLY DESIGNED TO PREVENT OIL MIST OR FLUID MIGRATION THROUGH AIR VENTS. THE RMF DEMISTER CONSISTS OF AN ALUMINIUM BODY WITH EXTERNAL COOLING RIBS AND CAN BE FITTED BELOW THE AIR CONDITIONER OR AIR FILTER.

Inside this aluminium body a coalescing post is positioned. When migrating oil vapour rises up this post the vapour coalesces into oil droplets which run down the outer diameter of the post and are guided back to tank through holes at the base of the post. In case of excessive splash the oil is contained in the post and runs down the slits in the post and is also returned to the reservoir.

OIL MIST

Air vents are used to compensate changes in air volume above the fluid level in gear boxes, hydraulic reservoirs, pump housings etc. High temperatures and thermal expansion cause migration of oil vapours through the air vent, blocking air filters and causing oil spills on machine surfaces. These fluid spills cause both an environmental and safety issue, they are also the cause of shortened air filter life and avoidable fluid consumption. In case of dynamic, volatile gearbox systems not only Oil Mist can migrate through air vents, but fluid splash can cause extreme fluid migration.





MOUNTING PLATES

RMF offers a range of Mounting or Adaptor Plates that can be fitted to hydraulic reservoirs, the mounting plates all have the standard DIN-24557/2 pattern. Mounting plates range from simple fitting of air conditioner only, mounting plate with additional port for vacuum indicator (Filter Minder), to mounting plates with additional porting, connection for suction and

return off Off-line filters.

The mounting plates allow for simple and quick air conditioner and off line filter installation without the need for welding/ drilling etc. The sealing on the tank lid is achieved by an 'O' ring which is part of delivery. The mounting plates can be used with all RMF Systems Air Conditioners.



FILTER MINDER

To monitor the state of the air filter, RMF Systems offers a Filter Minder (vacuum switch).

The filter minder is a combination graduated indicator and switch (N/O), a yellow indicator moves up in the window and locks at the highest air filter restriction. When it reaches the red zone, or highest recommended restriction, it closes a contact and can send a signal to the filter warning light. The locked position at highest restriction must be reset manually. The filter minder can be fitted to a variety of the RMF Mounting or Adaptor Plates.



Air conditioners Specifications

LIGHT VERSION SERIES ACL..R / ACM..R

| TYPE | ACL93R (C) | ACL96R (C), (V)* | ACM61R |
|-----------------------------------|-----------------------------|-----------------------|----------|
| Total weight | 0.9 kg | 1.1 kg | 0.4 kg |
| ZR gel volume | 300 cc | 600 cc | 100 cc |
| Water adsorption | 86 gram | 172 gram | 29 gram |
| Max. air flow | 700 l/min | 700 l/min (300 l/min) | 50 l/min |
| Adsorption material | ZR gel 3-6 mm | | |
| ZR gel | Non toxic | | |
| Operating temp.** | -40... +90 °C | | |
| Housing material | SAN (Styrene Acrylonitrile) | | |
| FLUID COMPATIBILITY | | | |
| Mineral Oils: H, HL, HLP, HVLP | Ok | | |
| HEES Synthetical ester | Ok | | |
| Other fluids | contact RMF Systems | | |

HEAVY DUTY SERIES KL..R

| TYPE | KL93R (C) | KL96R (C), (V)* | KL121R (C), (V)* | KL122R (C), (V)* | KL121R(V)S, | KL122R(V)S |
|--------------------------------|-----------------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Total weight | 1.2 kg | 1.5 kg | 2.7 kg | 4.0 kg | 4.2 kg | 5.5 kg |
| ZR gel volume | 300 cc | 600 cc | 1.000 cc | 2.000 cc | 1.000 cc | 2.000 cc |
| Water adsorption | 86 gram | 172 gram | 288 gram | 576 gram | 288 gram | 576 gram |
| Max. air flow | 700 l/min | 700 l/min (300 l/min) | 1.500 l/min (400 l/min) | 1.500 l/min (400 l/min) | 1.500 l/min (400 l/min) | 1.500 l/min (400 l/min) |
| Adsorption material | ZR gel 3-6 mm | | | | | |
| ZR gel | Non toxic | | | | | |
| Operating temp.** | -40... +90 °C | | | | | |
| Housing material | SAN (Styrene Acrylonitrile) | | | | | |
| Inner core | AISI 304 | | | | AISI 316 | |
| FLUID COMPATIBILITY | | | | | | |
| Mineral Oils: H, HL, HLP, HVLP | Ok | | | | | |
| HEES Synthetical ester | Ok | | | | | |
| Other fluids | contact RMF Systems | | | | | |

* C - Active coal, V - Check Valves

** Note that the operation of the desiccant breather may vary at temperatures below 0 °C due to very low humidity %.

SPIN-ON SPECIFICATION

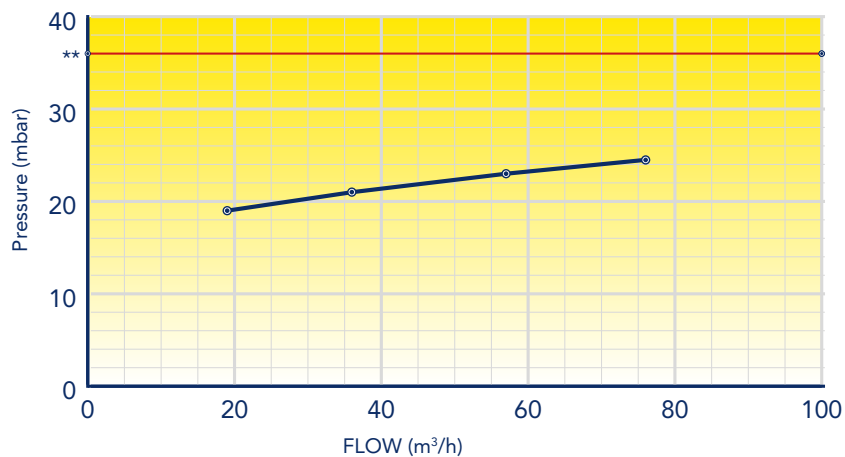
| PRODUCT DETAILS | KL60 | KL90 | KL120 | KL120S |
|-----------------------|---------------------|---------------------|----------------------|----------------------|
| Filter material | Glass fibre | | | Glass fibre |
| Housing material | Steel 0.50 DKP 7124 | | | AISI 316 |
| Surface Area | 415 cm ² | 754 cm ² | 2116 cm ² | 2000 cm ² |
| Filter efficiency | $\beta_3 = 200$ | | | |
| Dirt Holding Capacity | 3,2 gram MTD | 6,0 gram MTD | 16,5 gram MTD | |

FLOW PRESSURE DIFFERENTIAL RMF SPIN-ONS

| KL60 SPIN-ON | |
|----------------------------|--------------------------------|
| FLOW (M ³ /H) | DIFFERENCES OF PRESSURE (MBAR) |
| 19,0 | 19 |
| 36,0 | 21 |
| 57,0 | 23 |
| 76,0 | 24,5* |

*Max. Pressure Differential (Clean Filter)

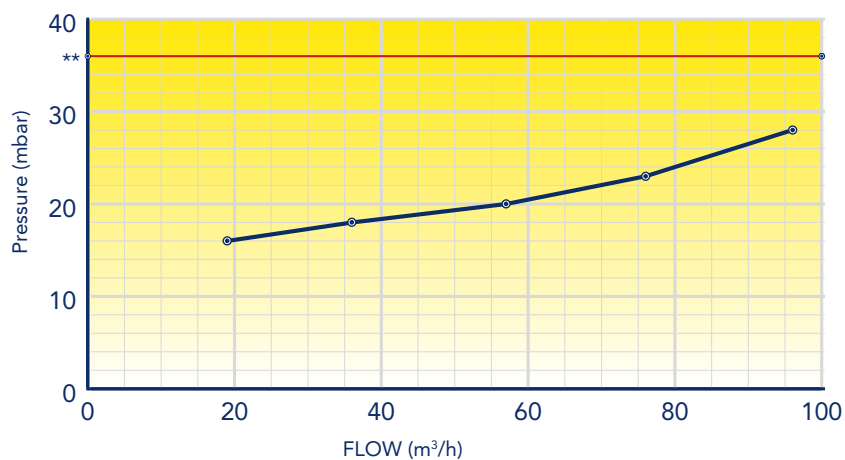
**Pump damages could become possible above red line!



| KL90 SPIN-ON | |
|----------------------------|--------------------------------|
| FLOW (M ³ /H) | DIFFERENCES OF PRESSURE (MBAR) |
| 19,0 | 16 |
| 36,0 | 18 |
| 57,0 | 20 |
| 76,0 | 23 |
| 96,0 | 28* |

*Max. Pressure Differential (Clean Filter)

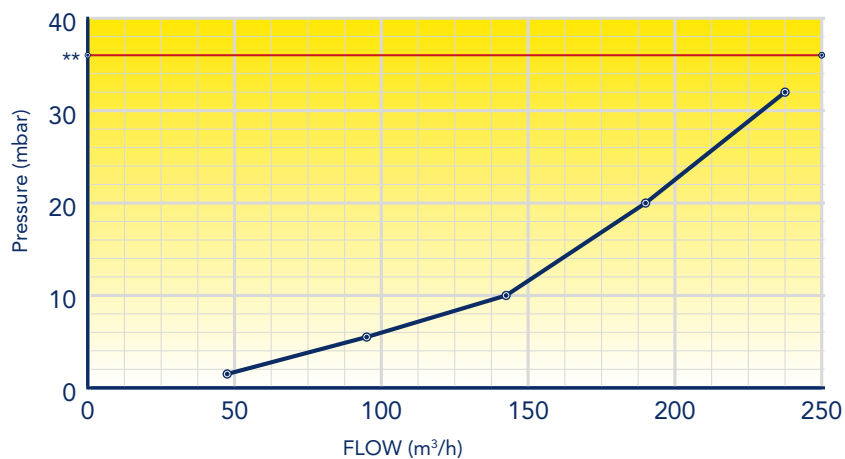
**Pump damages could become possible above red line!



| KL120 & KL120S SPIN-ON | |
|----------------------------|--------------------------------|
| FLOW (M ³ /H) | DIFFERENCES OF PRESSURE (MBAR) |
| 47,5 | 1,5 |
| 95,0 | 5,5 |
| 142,5 | 10 |
| 190,0 | 20 |
| 237,5 | 32* |

*Max. Pressure Differential (Clean Filter)

**Pump damages could become possible above red line!



DIMENSIONS AIR CONDITIONERS

LIGHT VERSION SERIES ACL..R / ACM..R

| DIMENSIONS* | ACL93R (V) | ACL96R (C), (V) | ACM61R |
|-------------|---------------|-----------------|---------------|
| L1 | 150 mm | 210 mm | 135 mm |
| Ø D | 96 mm | 96 mm | 68 mm |
| G | ¾" BSP female | ¾" BSP female | ¾" BSP female |

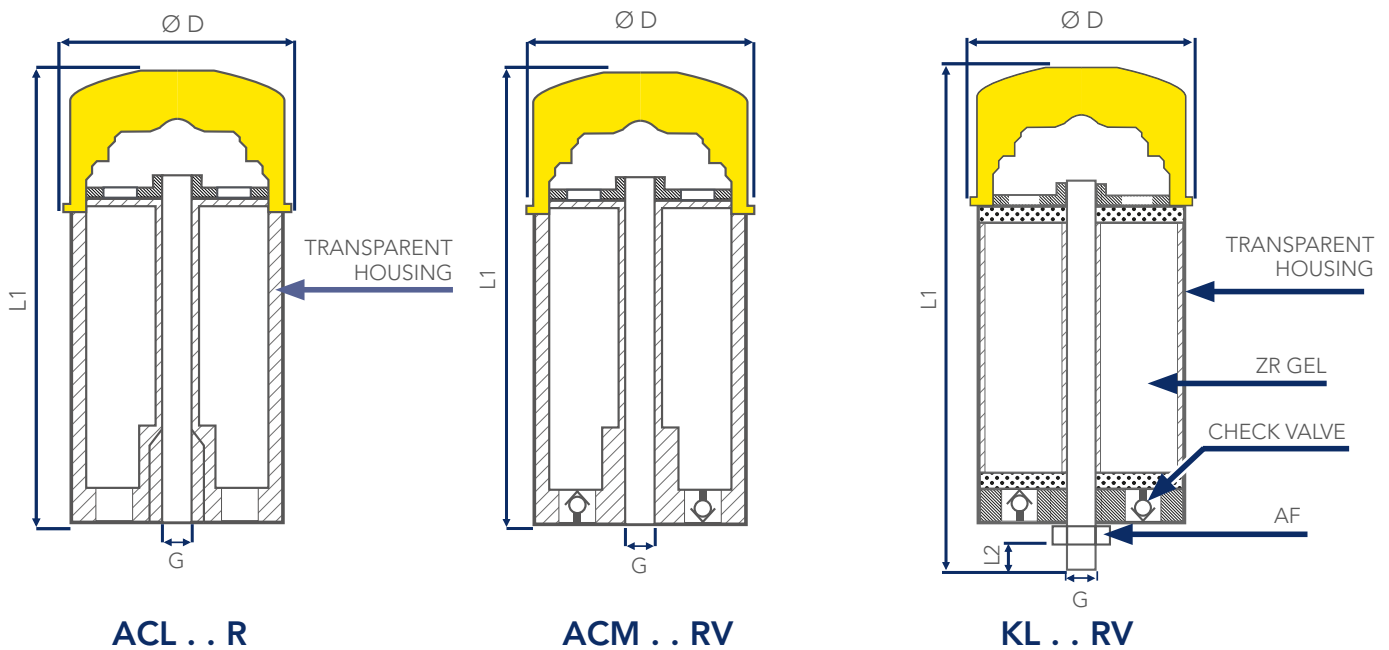
HEAVY DUTY SERIES KL..R

| DIMENSIONS | KL93R (C) | KL96R (C), (V) | KL121R (C), (V) | KL122R (C), (V) | KL121R(V)S, | KL122R(V)S |
|-----------------|-------------|----------------|-----------------|-----------------|---------------|---------------|
| L1 ¹ | 177 mm | 238 mm | 280 mm | 391 mm | 310 mm | 421 mm |
| L2 ² | 20 mm | 20 mm | 24 mm | 24 mm | 24 mm | 24 mm |
| ØD ³ | 96 mm | 96 mm | 130 mm | 130 mm | 128 mm | 128 mm |
| G | ¾" BSP male | ¾" BSP male | 1 ¼" BSP male | 1 ¼" BSP male | 1 ¼" BSP male | 1 ¼" BSP male |
| AF | 32 mm | 32 mm | 50 mm | 50 mm | 50 mm | 50 mm |

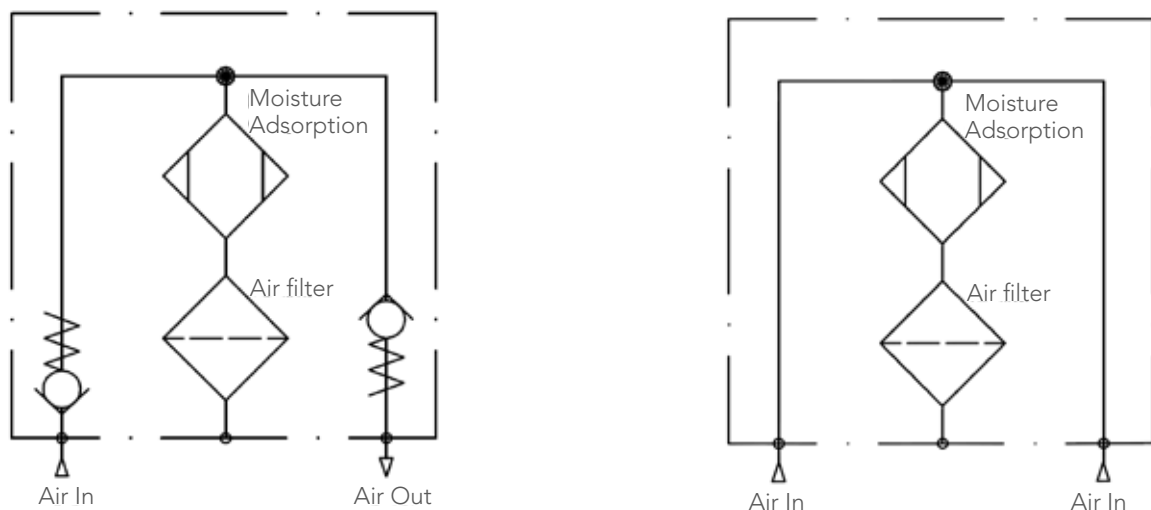
¹ Please note that dimension may vary. Tolerance ± 6 mm

² Please note that dimension may vary. Tolerance ± 2 mm

³ Please note that dimension may vary. Tolerance ± 1 mm



HYDRAULIC SYMBOL



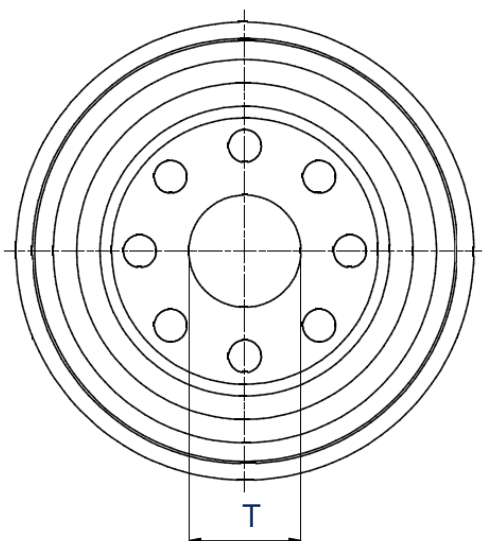
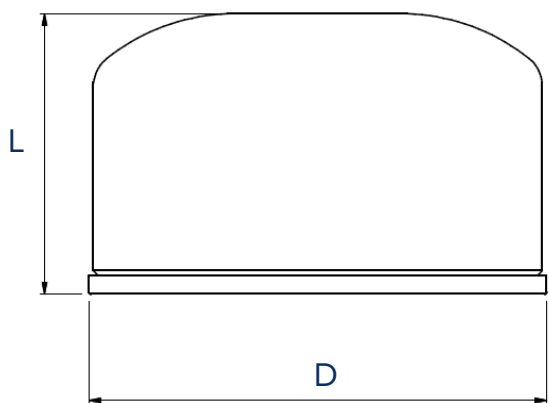
With check valves

Without check valves

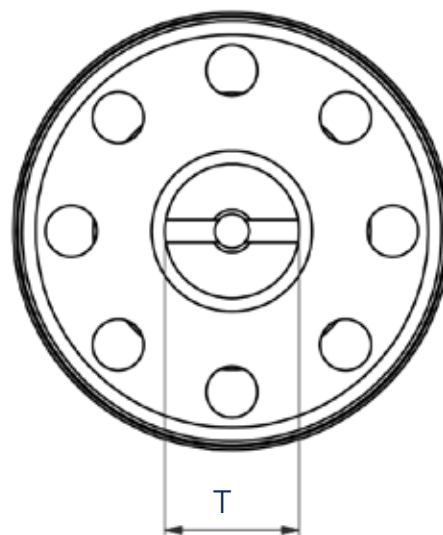
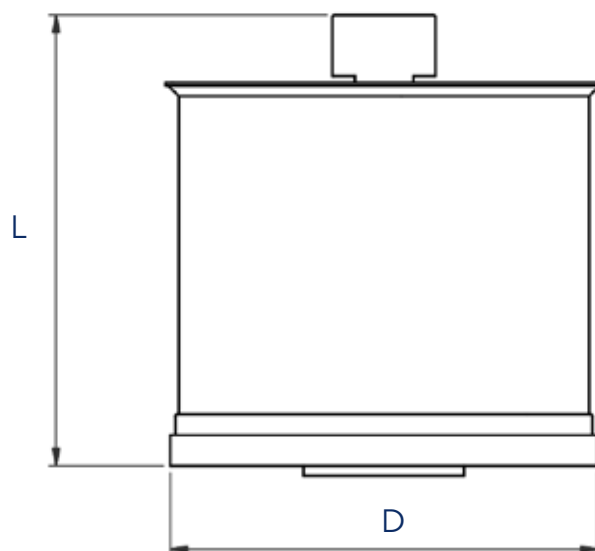
DIMENSIONS SPIN-ON AIR FILTERS

| DIMENSIONS SPIN-ONS | | | | |
|---------------------|---------|----------|------------|--------|
| | KL60 | KL90 | KL120 | KL120S |
| L | 60 mm | 60 mm | 100 mm | 132 mm |
| Ø D ¹ | 69 mm | 98 mm | 130 mm | 128 mm |
| T | M20x1,5 | R ¾ BSP" | R 1 ¼ BSP" | R 1 ¼" |

¹ Please note that dimension may vary. Tolerance ± 1 mm



KL60, KL90, KL120



KL120S

Air conditioners Ordering codes

YOUR AIR CONDITIONER ORDERING CODE

| TABLE 1 | TABLE 2 | TABLE 3 | TABLE 4 | TABLE 5 |
|---------|---------|---------|---------|---------|
| | | | | |

TABLE 1 - TYPE OF BODY

| TYPE OF BODY | TANK CONNECTION | AIR FILTER | CODE |
|--|--|------------------------|------|
| Heavy duty version | Male threading on stainless steel tube | 3µ glass fibre spin-on | KL |
| Light version (only in 93 and 96 series) | Female threading in plastic housing | 3µ glass fibre spin-on | ACL |
| Mini light version (only in 60 series) | Female 3/8" threading in plastic housing with two integrated check valves (0.01 bar) | 3µ glass fibre spin-on | ACM |

TABLE 2 - DIMENSIONS

| MAX. AIR FLOW STANDARD VERSION | RESTRICTED AIR FLOW WITH CHECK VALVES | CODE |
|--------------------------------|---------------------------------------|------|
| ONLY SUITABLE FOR KL SERIES | | |
| 700 l/min | N.A. | 93 |
| 700 l/min | 300 l/min | 96 |
| 1500 l/min | 400 l/min | 121 |
| 1500 l/min | 400 l/min | 122 |
| ONLY SUITABLE FOR ACL SERIES | | |
| 700 l/min | N.A. | 93 |
| 700 l/min | 300 l/min | 96 |
| ONLY SUITABLE FOR ACM SERIES | | |
| N.A. | 50 l/min | 61 |

TABLE 3 - SPECIFICATIONS

| TYPE | DRYING AGENT | DESICCANT VOLUME | NOMINAL WATER ABSORBING CAPACITY | CODE |
|------|-------------------------------------|------------------|----------------------------------|------|
| 61 | ZR-gel | 100 cc | 29 grams | R |
| 93 | ZR-gel | 300 cc | 86 grams | R |
| 96 | ZR-gel | 600 cc | 172 grams | R |
| 121 | ZR-gel | 1000 cc | 288 grams | R |
| 122 | ZR-gel | 2000 cc | 576 grams | R |
| 93 | Approx. 2/3 ZR-gel, 1/3 active coal | 200 cc / 100 cc | 57 grams | RC |
| 96 | Approx. 2/3 ZR-gel, 1/3 active coal | 400 cc / 200 cc | 115 grams | RC |
| 121 | Approx. 2/3 ZR-gel, 1/3 active coal | 700 cc / 300 cc | 201 grams | RC |
| 122 | Approx. 2/3 ZR-gel, 1/3 active coal | 1400 cc / 600 cc | 403 grams | RC |

TABLE 4 - OPTIONS

| | CODE |
|--|------|
| No check valves | - |
| Integrated check valves (0.01 bar), not available for 93 series. | V |
| Note: restricted airflow | |

TABLE 5 - OPTIONS*

| | CODE |
|-------------------------|------|
| Standard spin-on | - |
| Stainless steel spin-on | S |

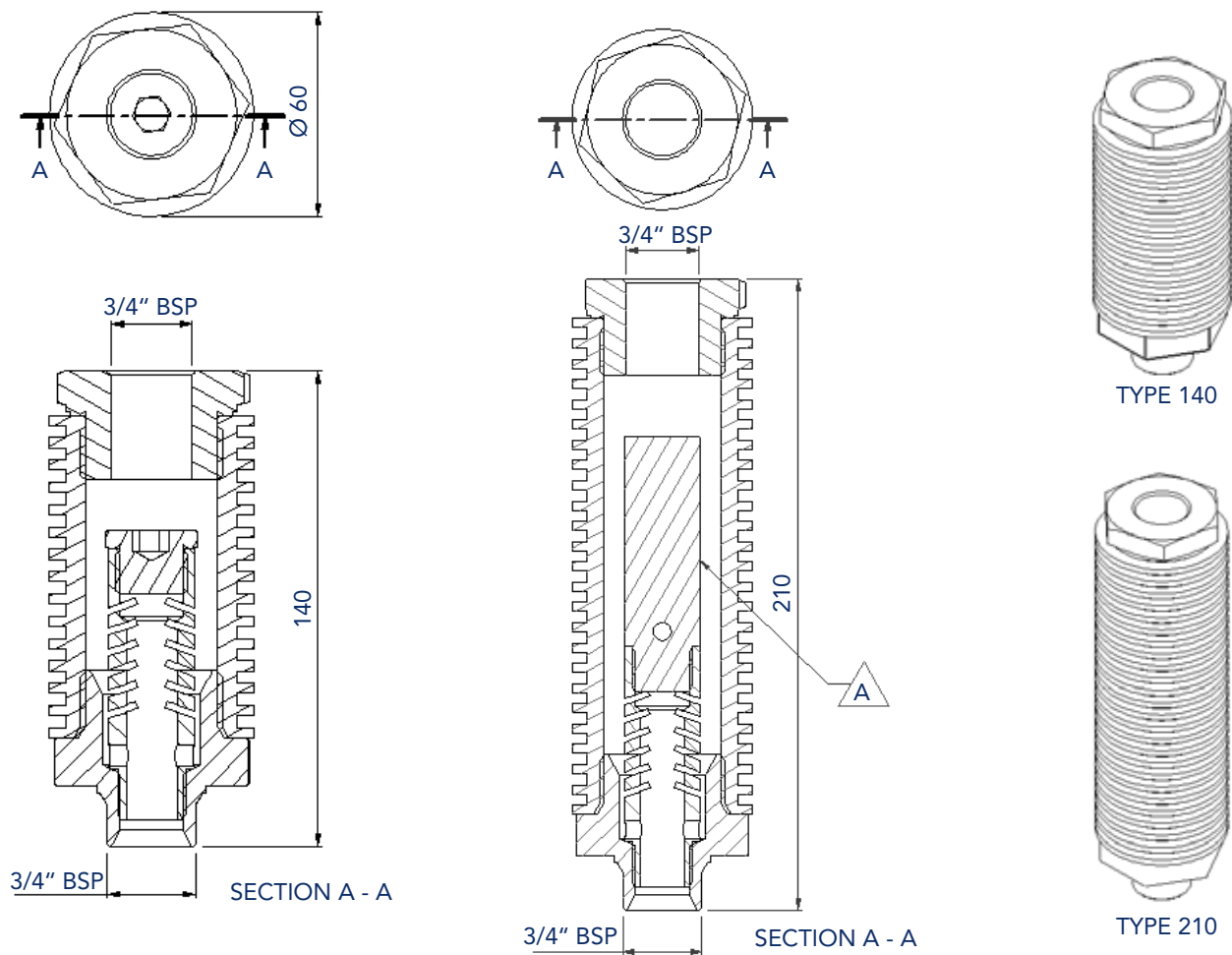
* Only available in combination with KL121 & KL122 series Air Conditioners.

Please note the following:

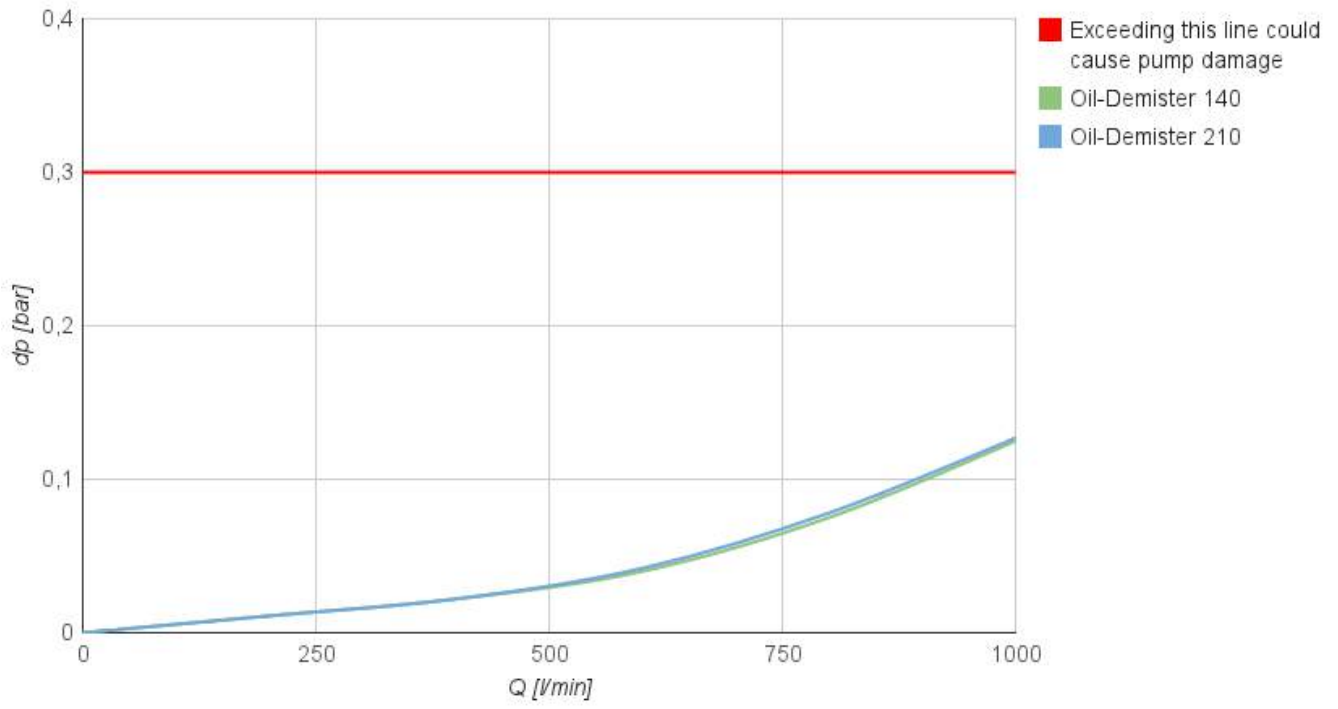
Installing an Air Conditioner with spring loaded check valves may cause an over- or under pressure of approximately 0.01 bar (10mbar) inside the reservoir.

Oil-Demister Specifications

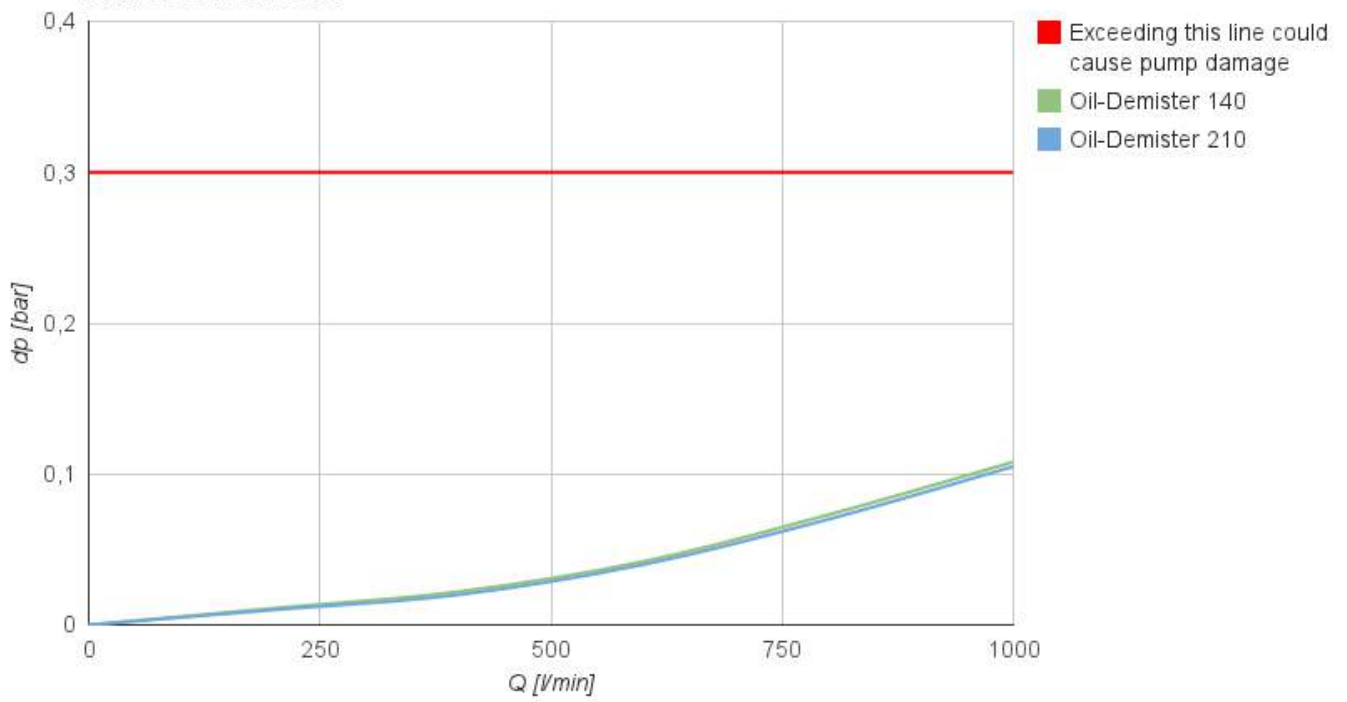
| OIL-DEMISTER | 140 | 210 |
|------------------------------|----------------------------|----------------------------|
| DIMENSIONS | | |
| | 140x60 mm | 210x60 mm |
| WEIGHT | | |
| | 1,03 kg | 1,25 kg |
| CONNECTIONS | | |
| | Base 3/4" BSP int. | Base 3/4" BSP int. |
| | Top 3/4" BSP or 1 1/4" BSP | Top 3/4" BSP or 1 1/4" BSP |
| MATERIAL | | |
| Body | Anodized Aluminum | |
| Base adaptor | Steel | |
| Top adaptor | Steel | |
| Flow rate (air) | 1000 l/min. | |
| OIL-DEMISTER CAPACITY | | |
| | See diagram | |



Airflow test into a tank



Airflow out of a tank



Ordering Code

AIR CONDITIONERS SPARE PARTS AND ACCESSORIES

| SPARE PARTS | ORDERING CODE | | | |
|--|---------------------------------------|---------------------------------------|------------------------------------|------------------------------------|
| DESCRIPTION | ACL93 AND KL93 SERIES | ACL96 AND KL96 SERIES | KL121 SERIES | KL122 SERIES |
| Air filter spin-on | KL90 (incl. seal) | | KL120 (incl. seal) | |
| Stainless steel air filter spin-on | N.A. | | KL120S (incl. seal) | |
| Stainless steel air filter only | N.A. | | 120S (incl. seal) | |
| ZR-gel refill in air tight container | KL/ACL 93 series refill ZR-gel 300 cc | KL/ACL 96 series refill ZR-gel 600 cc | KL121 series refill ZR-gel 1000 cc | KL122 series refill ZR-gel 2000 cc |
| ZR-gel refill in air tight container | Refill ZR gel 4000 cc | | | |
| Active coal refill in air tight container ¹ | 300 cc | 300 cc | 300 cc | 600 cc |
| Spare kit including ZR-gel, air filter spin-on, seal and foam pads | Spare kit KL93R/ACL93R | Spare kit KL96R/ACL96R | Spare kit KL121R | Spare kit KL122R |

¹ Please note that smallest Active coal refill available is 300 cc container. To be used for 93, 96 and 121 series

| ACCESSORIES | ORDERING CODE | | | | |
|---|------------------------|----------------------|---------------|--------------|--------------|
| DESCRIPTION | ACL93 AND ACL96 SERIES | KL93 AND KL96 SERIES | ACL121 SERIES | KL121 SERIES | KL122 SERIES |
| Filter minder (indicator + electr. contact and nipple) | 9331303 | | | | |
| Filter minder connector (w/o cable) for use with 9331303 | 9331320 | | | | |
| Mounting plate | KL92 | | KL1202 | | |
| Mounting plate + filter minder port | KLS91 | KL95 | KLS1201 | KL1205 | |
| Mounting plate + filter minder port + return port | KL91 | | KL1201 | | |
| Mounting plate + filter minder port + Suction and return port | KL91SR | | N.A. | | |
| Barrel Adapter | KL75 | | N.A. | | |
| Pressurised Tank Adapter | KL98 | | N.A. | | |
| Mounting plate with check valves | N.A. | | KL1200V | | |
| Oil-Demister small | 140 | | N.A. | | |
| Oil-Demister large | 210 | | N.A. | | |
| Pall to RMF Systems Adaptor | KL99 | | N.A. | | |

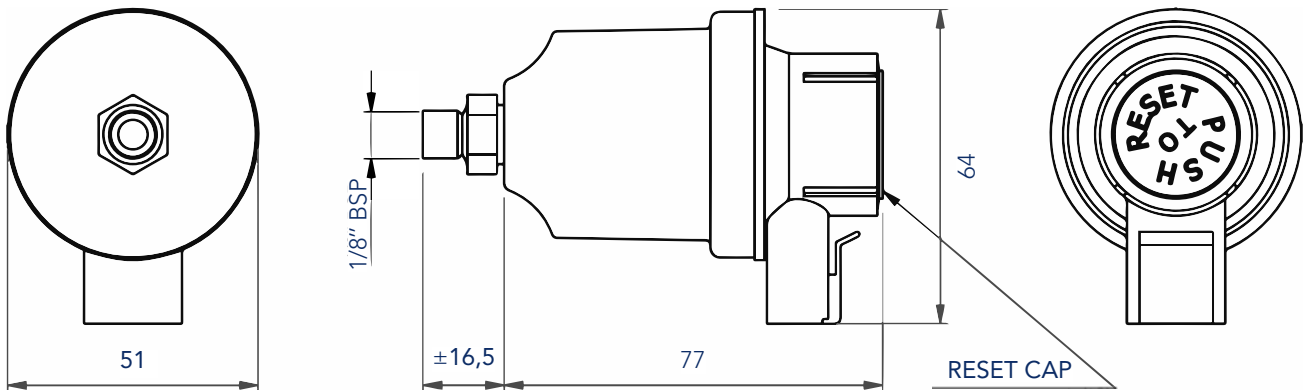
Filter Minder Specifications

The graduated indicator monitors the airfilter. The position indicator progressively fills the window as the air filter restriction increases, looking at the highest restriction.

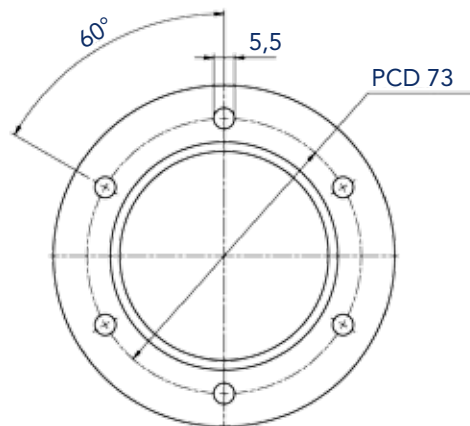
The airfilter should be changed when the position indicator reaches the red zone.



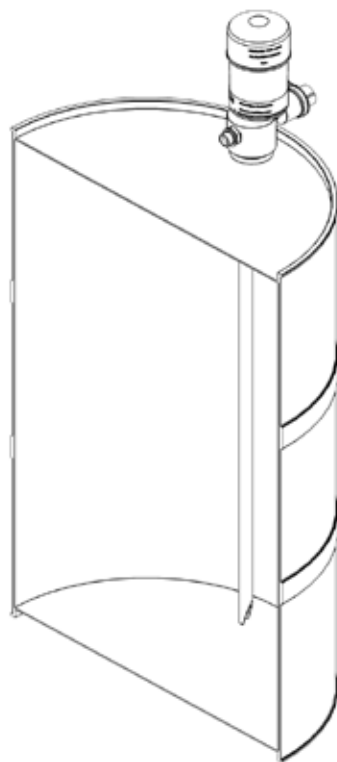
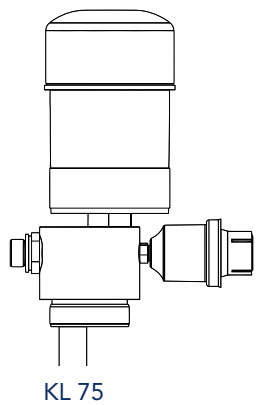
| SPECIFICATIONS | |
|-----------------------|-----------------------|
| OPERATING TEMP. | -40° C to +120° C |
| MATERIAL | Polycarbonate Housing |
| STANDARD CALIBRATION | 2 to 8,7 kPa |
| (VACUUM) FULL SCALE | 5,0 kPa (20 IN.) |
| VACUUM FIRST MOVEMENT | 1,5 kPa (6 IN.) |
| SWITCHING VOLTAGE | 300 VDC Max. |
| VOLTAGE BREAKDOWN | 450 VDC Max. |
| SWITCHING CURRENT | 1,20 A Max. |
| CARRYING CURRENT | 0,50 A Max. |



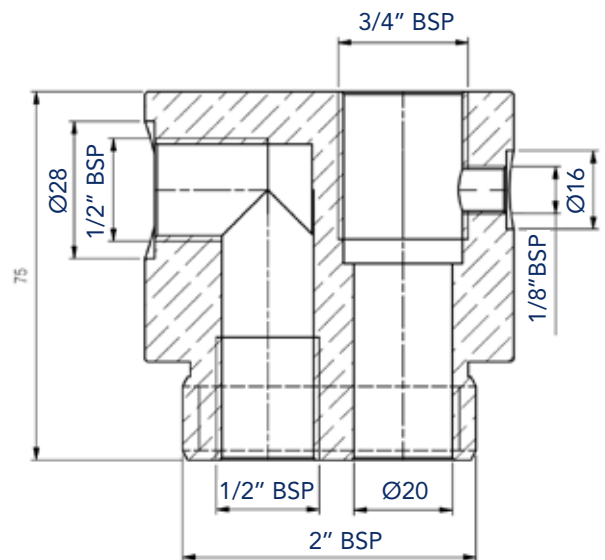
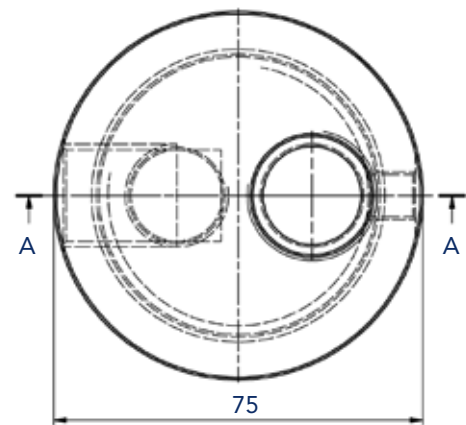
Mounting Plate Dimensions



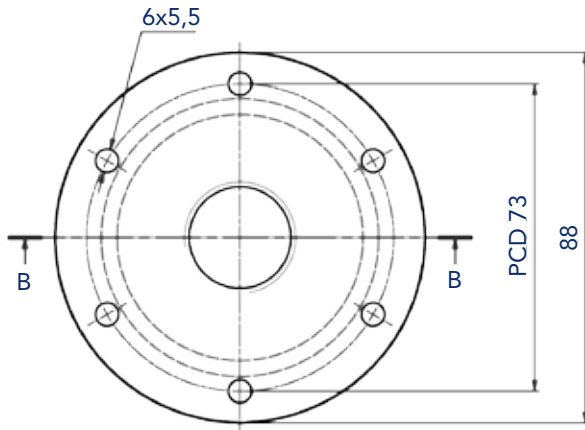
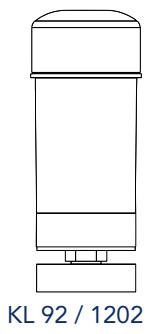
All mounting plates are drilled according pattern DIN 24557/2



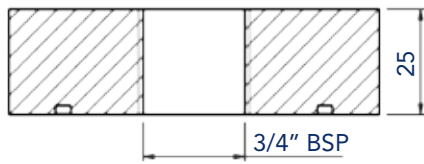
Example KL 75



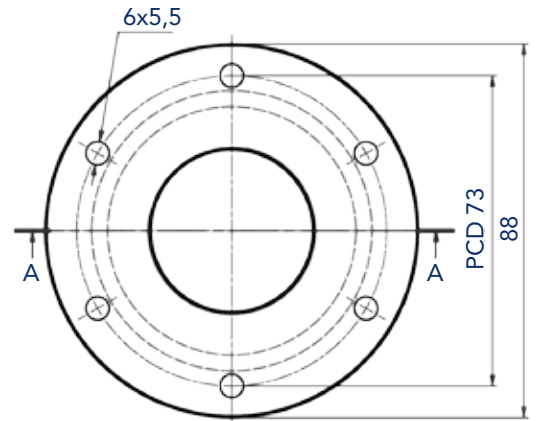
SECTION A - A



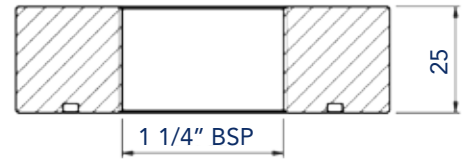
SECTION B - B



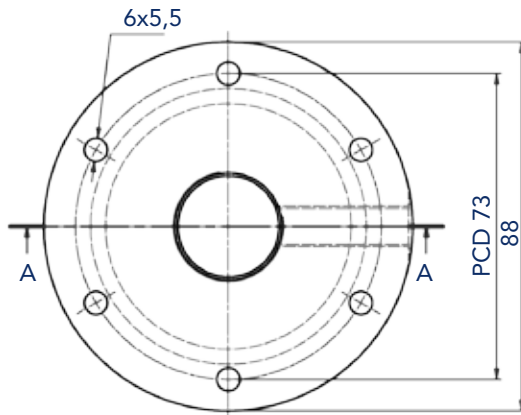
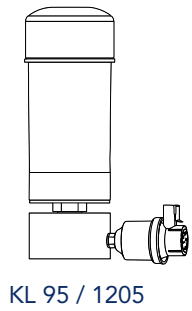
KL 92



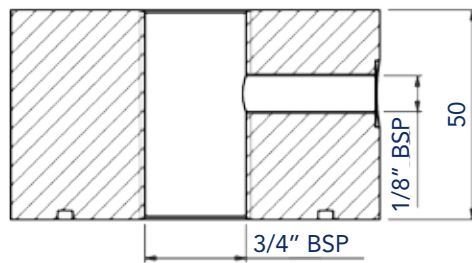
SECTION A - A



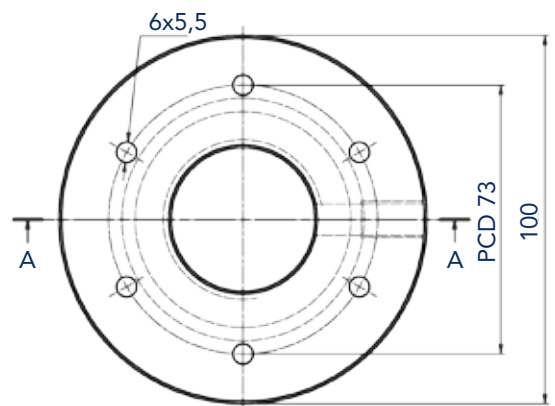
KL 1202



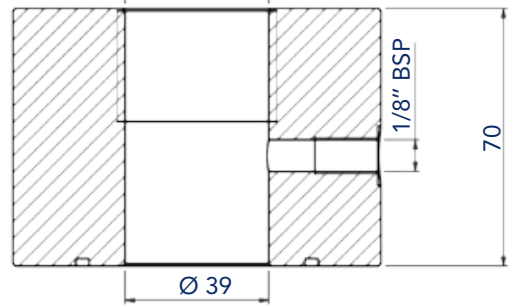
SECTION A - A



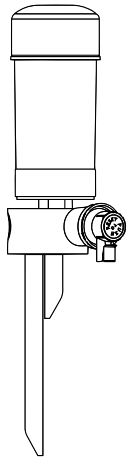
KL 95



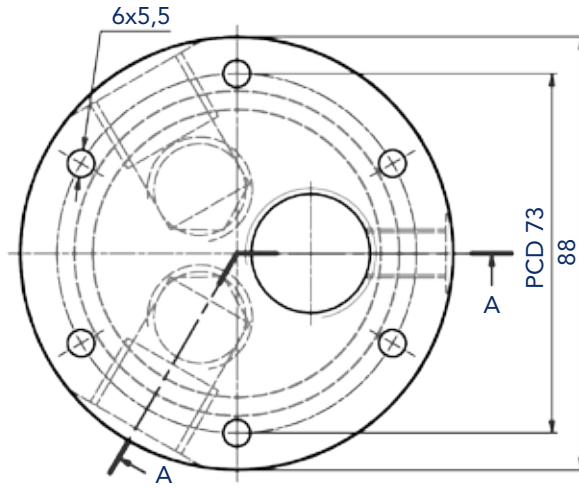
SECTION A - A



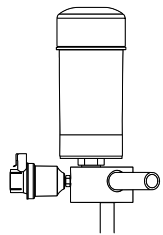
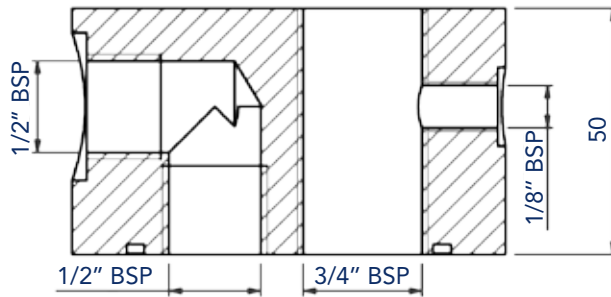
KL 1205



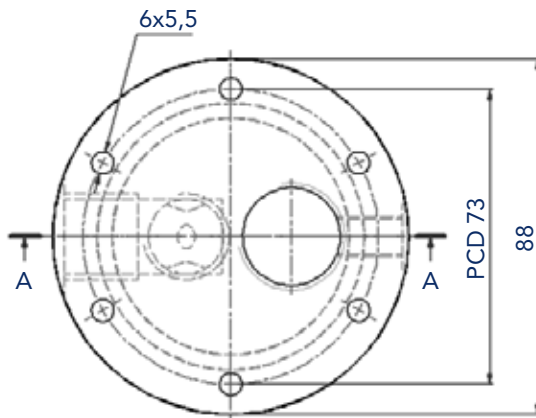
KL 91SR



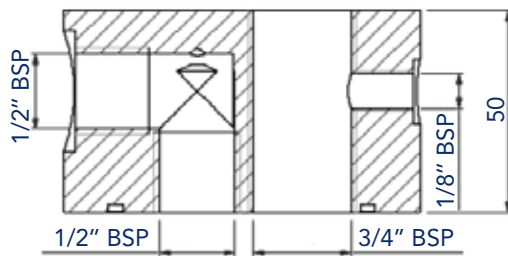
SECTION A - A



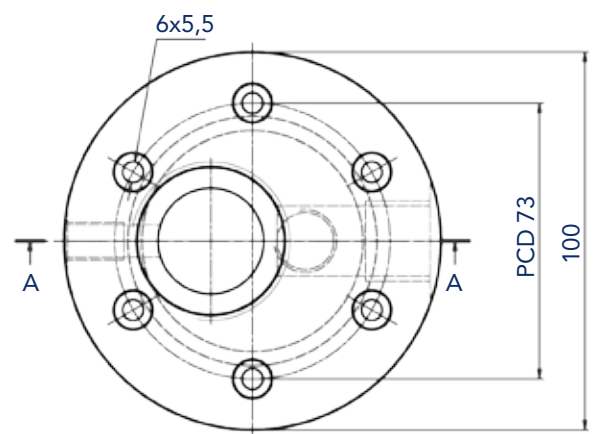
KL 91 / KL 1201



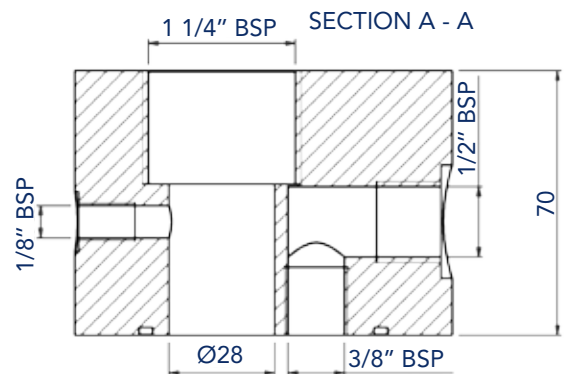
SECTION A - A



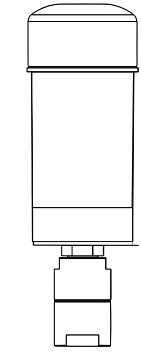
KL 91



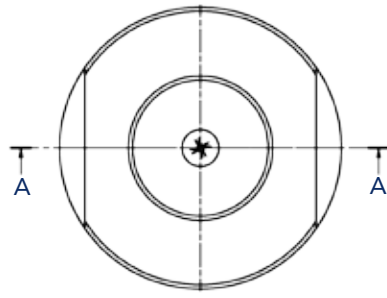
SECTION A - A



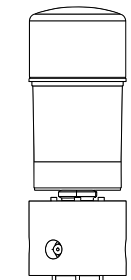
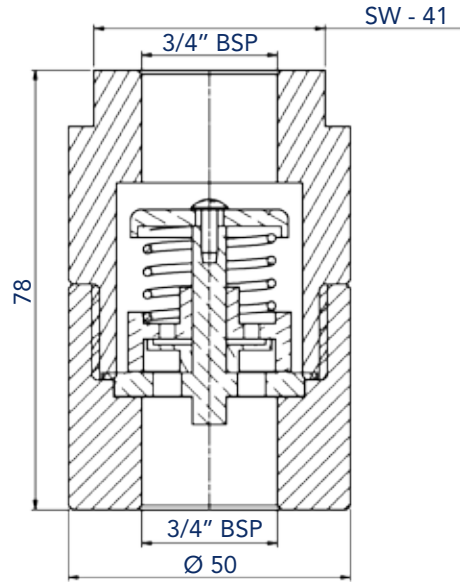
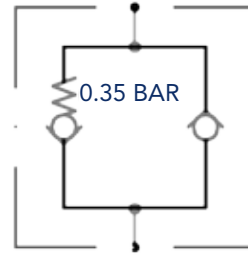
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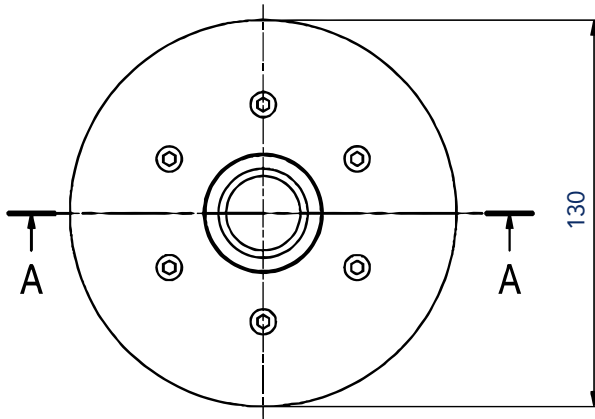
KL 98



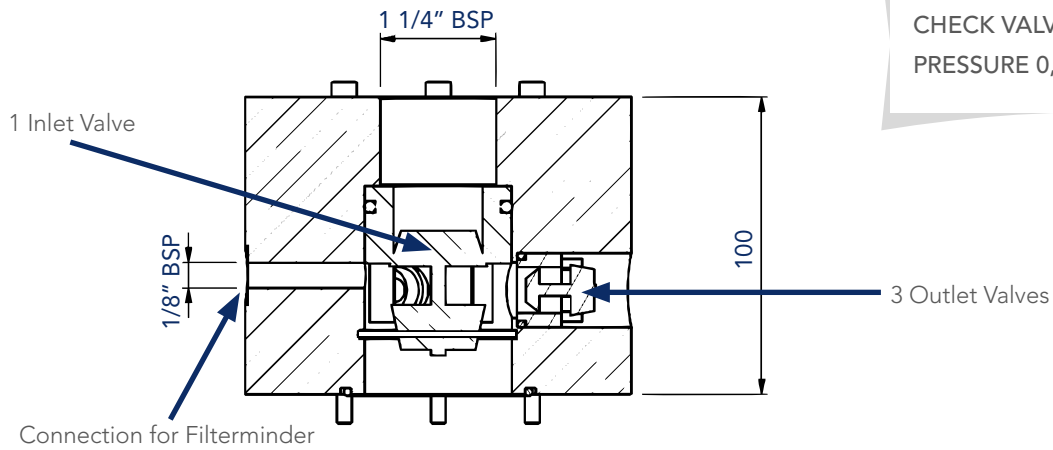
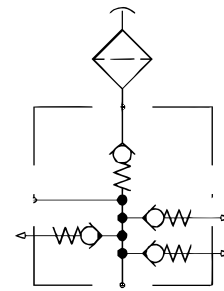
SECTION A - A



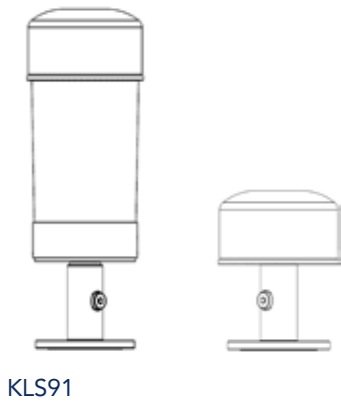
KL 1200V



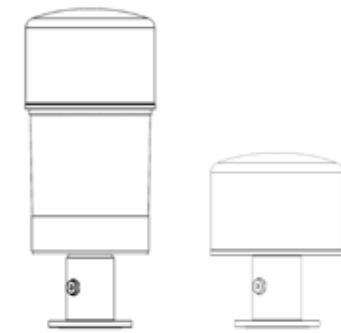
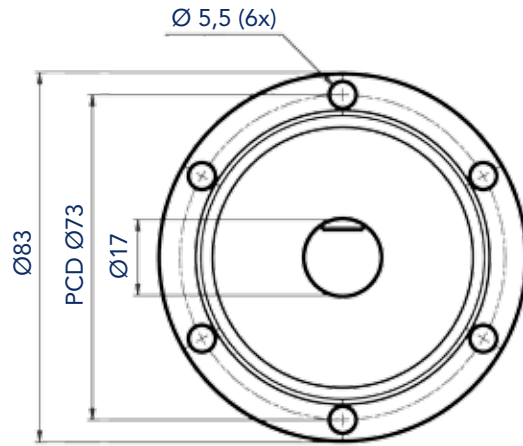
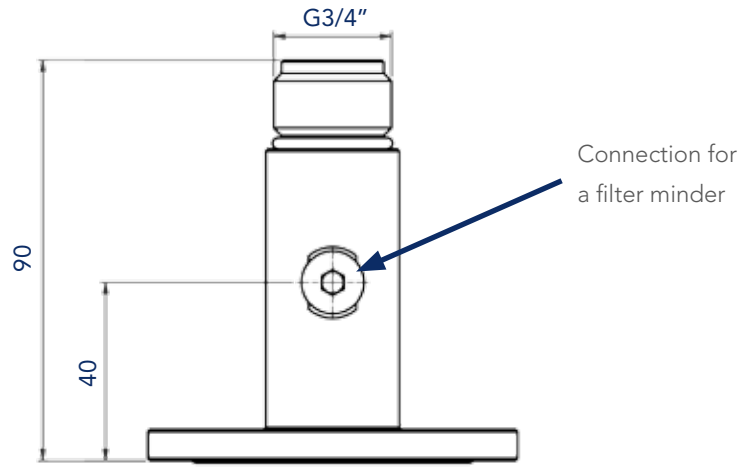
Section A-A



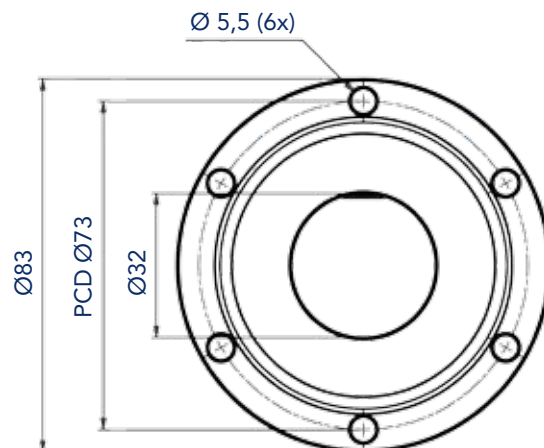
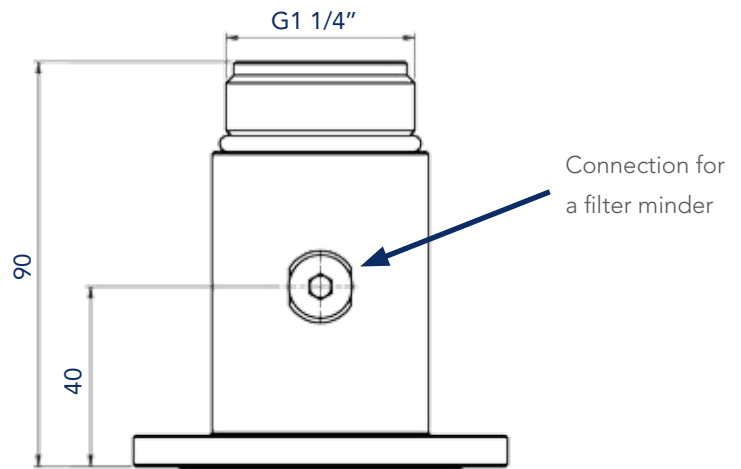
CHECK VALVE CRACKING
PRESSURE 0,01 - 0,02 BAR



KLS91



KLS1201





SUBJECT TO CHANGE
WITHOUT PRIOR NOTICE
B_AIR CONDITIONERS_20160720_EN