

HYDAC

INTERNATIONAL

Air Cooled Oil Coolers SC & OK Series

FEATURES

- High efficient plate and fin style heat exchangers
- Externally mounted heat exchangers for easy maintenance and cleaning
- SC and OK series feature a modular pump and filter options for a plug and play fluid conditioning system
- Available with HYDAC MF and LPF series filters
- Accessories Include: Thermostats (*adjustable and fixed*), Integrated Thermostatic Bypass Valves, and Bypass Valves
- Noise levels under 70 dBa

SC Series

The SC Series cooler design uses a large blower wheel which spins slowly to draw air through an oversized cooler. This combination offers excellent cooling capacity with low noise.

- Up to 16 HP cooling capacity
- Down to 64 dBa noise level
- Warm air is directed up and away from work area
- Packaged systems with pump flows ranging from 3.1 GPM to 18.5 GPM
- Maximum flows (*w/o pump*) up to 42 GPM

OK Series

The OK series coolers use an axial fan for moving air across the heat exchanger.

- Up to 100 HP cooling capacity
- Packaged systems with pump flows ranging from 8.45 GPM to 47.5 GPM
- Maximum flows (*w/o pump*) up to 80 GPM



SC Series



OK Series

ADVANTAGES

The advantages of an off line cooling system are a stable cooling and filtration performance irrespective of variations in flow and duty cycle of the main hydraulic circuit. This allows the cooler to be sized to fit the heat load and not the maximum return flow of the main circuit. A further advantage is that the off-line cooler is completely isolated from surge pressures in the return line that can potentially damage the cooler. Also, maintenance can be performed on the filters without having to shut down the main system.

APPLICATIONS

- Hydraulic Power Units
- Elevators
- Gearboxes
- Lubrication Systems
- Presses
- Machine Centers

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Model Code: SC Series

SC 1L 1.5 A 8 MF95 3 B TR1

Model

| Code | Description |
|-------------|--|
| SC | = Basic Cooler |
| SCF | = Cooler with filter |
| SCA | = Cooler with circulator pump |
| SCAF | = Cooler with circulator pump and filter |

Cooler Size

| Code | Description |
|-------------|---------------------------------------|
| OS | |
| 1L | |
| 1S | See heat transfer table found on page |
| 2L | 3 to determine proper size. |
| 2S | L = 1200 RPM |
| 3L | S = 1800 RPM |
| 3S | |
| 4L | |
| 4S | |

Design and Modification numbers,
determined by factory.
Latest Version always supplied

Motor

| Code | Description |
|-------------|---|
| A | = 1 phase 115/230 volt <i>(only available on SC/SCA-0 and 1 models)</i> |
| B | = 3 phase 230/460 volt <i>(575 volt optional, contact factory)</i> |

Pumps

| Code | Pump Displacement | GPM (L) 1200 RPM | GPM (S) 1800 RPM | Heat Exchanger Size |
|---------------|--------------------------|---|-------------------------|----------------------------|
| <i>(omit)</i> | = | ----- No Pump for SC and SCF Models ----- | | |
| 10 | = 10 ccm/rev | 3.1 | 4.75 | OS, 1L, 1S |
| 28 | = 28 ccm/rev | 8.4 | 12.75 | 2L, 2S, 3L, 3S, 4L, 4S |
| 40 | = 40 ccm/rev | 12 | | 2L, 3L, 4L |

Filter Type *(not applicable for SC and SCA models)*

| Code | Description | Rated GPM* | Code | Description | Rated GPM |
|---------------|---------------------------------|-------------------|---------------|--------------------|------------------|
| <i>(omit)</i> | = No filter / SC and SCA models | | LPF160 | Cartridge | 42 |
| MF95 | = Spin-on | 25 | LPF240 | Cartridge | 63 |
| MF190 | = Spin-on | 30 | | | |
| MF195 | = Spin-on | 60 | | | |

Micron Rating

| Code | Description |
|---------------|---------------------------------|
| <i>(omit)</i> | = No filter / SC and SCA models |
| 3 | = 3 microns, Absolute |
| 5 | = 5 microns, Absolute |
| 10 | = 10 microns, Absolute |
| 20 | = 20 microns, Absolute |

Filter Indicator

| Code | Series | Description |
|---------------|---------------|---------------------------------------|
| <i>(omit)</i> | = | No filter - |
| B | = MF | Visual |
| C | = LPF | Electrical (AC/DC) |
| D24 | = LPF | Visual (lamp) and Electrical (switch) |
| D115 | = LPF | Visual (lamp) and Electrical (switch) |
| D230 | = LPF | Visual (lamp) and Electrical (switch) |

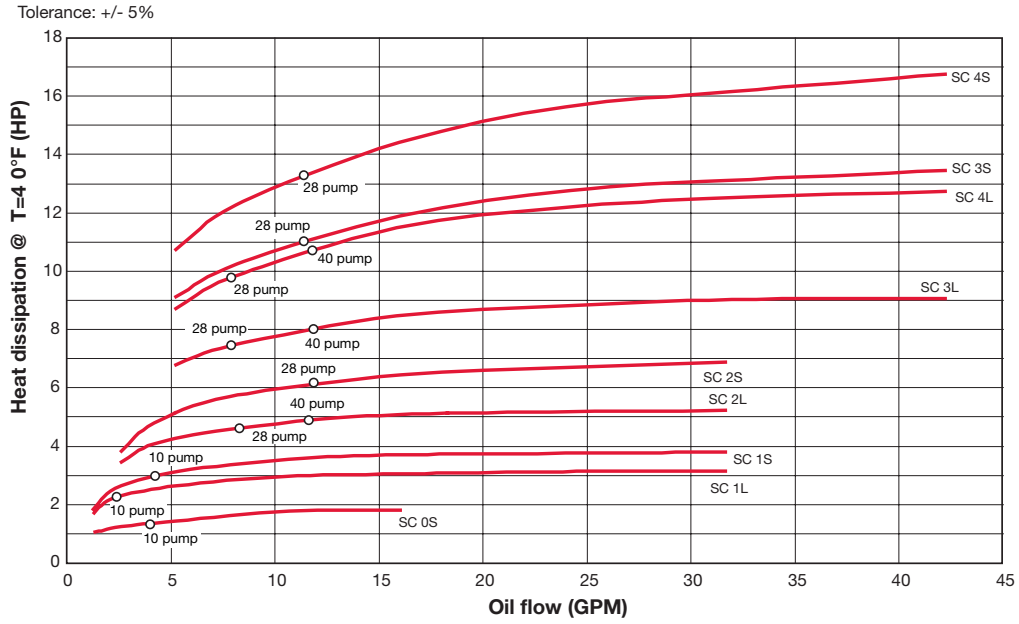
] numbers indicate supplu voltage for light LPF Filters only

Accessories

| Code | Description |
|---------------|--|
| <i>(omit)</i> | = None |
| TR1 | = Reservoir Thermostat, adjustable 0° to 200°F |
| IBT-45 | = Thermostatic bypass valve, 113° to 131°F |
| IBT-55 | = Thermostatic bypass valve, 130° to 150°F |
| IBT-60 | = Thermostatic bypass valve, 140° to 158°F |
| IBP-2 | = Bypass valve, 29 PSI |
| IBP-3 | = Bypass valve, 45 PSI |
| AITR | = Inline Thermostat, adjustable 0° to 200°F |
| TS-120 | = Inline Thermostat, fixed 120°F |
| TS-140 | = Inline Thermostat, fixed 140°F |
| TS-160 | = Inline Thermostat, fixed 160°F |

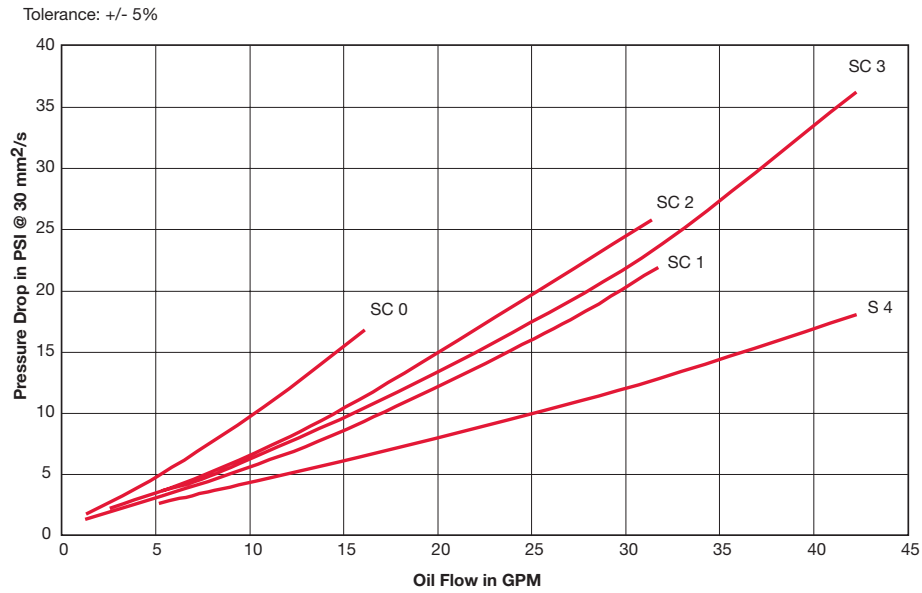
] only available with SC & SCF Units

Cooling Capacities: SC Series



Pressure Drops: SC Series

Pressure differential Δp depending on flow rate Q and the viscosity of the oil.
Graph uses oil viscosity of $30 \text{ mm}^2/\text{s}$.

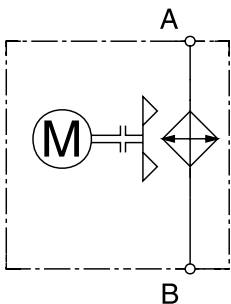


For oil viscosities other than $30 \text{ mm}^2/\text{s}$, in the graph above multiply the Δp by the factor k for the corrected pressure drop.

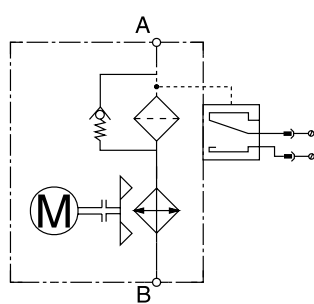
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|----------|-----|------|------|-----|-----|------|-----|-----|-----|
| SSU | 46 | 70 | 102 | 150 | 213 | 250 | 315 | 464 | 695 |
| mm/sec | 10 | 15 | 22 | 32 | 46 | 54 | 68 | 100 | 150 |
| Factor K | 0.5 | 0.65 | 0.77 | 1 | 1.3 | 1.52 | 1.9 | 2.8 | 5.3 |

Hydraulic Symbols: SC Series

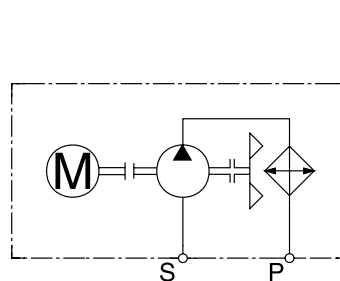
SC



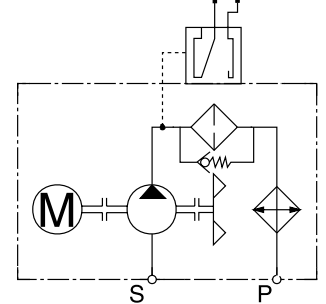
SCF



SCA



SCAF



SC Specifications / Engineering Data

SPECIFICATIONS

| COOLER MODEL | | FLUID SPECIFICATIONS | | | MOTOR SPECIFICATIONS | | | |
|-----------------|-------------|--------------------------------|--------------------------------------|--------------|-------------------------------|----------|-----------|-------------|
| Model | Description | Max. Oil Flow Without Pump GPM | Pump Displacement. Per Pump Code GPM | | Noise Level dBa* ¹ | Motor kW | Motor RPM | Weight lbs. |
| SC-0, SCF-0 | Fan | 16 | - | - | 68 | 0.21 | 1800 | 31 |
| SCA-0, SCAF-0 | Fan/Pump | - | Code 10 - 4.75 | - | 70 | 0.43 | 1800 | 51 |
| SC-1L, SCF-1L | Fan | 32 | - | - | 64 | 0.30 | 1200 | 47 |
| SCA-1L, SCAF-1L | Fan/Pump | - | Code 10 - 3.1 | - | 68 | 0.43 | 1200 | 69 |
| SC-1S, SCF-1S | Fan | 32 | - | - | 69 | 0.30 | 1800 | 47 |
| SCA-1S, SCAF-1S | Fan/Pump | - | Code 10 - 4.75 | - | 71 | 0.43 | 1800 | 69 |
| SC-2L, SCF-2L | Fan | 32 | - | - | 66 | 0.43 | 1200 | 71 |
| SCA-2L, SCAF-2L | Fan/Pump | - | Code 28 - 8.45 | Code 40 - 12 | 68 | 1.30 | 1200 | 99 |
| SC-2S, SCF-2S | Fan | 32 | - | - | 76 | 0.70 | 1800 | 71 |
| SCA-2S, SCAF-2S | Fan/Pump | - | Code 28 - 12.75 | - | 77 | 1.80 | 1800 | 99 |
| SC-3L, SCF-3L | Fan | 42 | - | - | 73 | 0.70 | 1200 | 104 |
| SCA-3L, SCAF-3L | Fan/Pump | - | Code 28 - 8.45 | Code 40 - 12 | 73 | 1.30 | 1200 | 148 |
| SC-3S, SCF-3S | Fan | 42 | - | - | 82 | 0.91 | 1800 | 104 |
| SCA-3S, SCAF-3S | Fan/Pump | - | Code 28 - 12.75 | - | 84 | 2.20 | 1800 | 148 |
| SC-4L, SCF-4L | Fan | 42 | - | - | 73 | 0.70 | 1200 | 108 |
| SCA-4L, SCAF-4L | Fan/Pump | - | Code 28 - 8.45 | Code 40 - 12 | 73 | 1.30 | 1200 | 152 |
| SC-4S, SCF-4S | Fan | 42 | - | - | 82 | 0.91 | 1800 | 108 |
| SCA-4S, SCAF-4S | Fan/Pump | - | Code 28 - 12.75 | - | 84 | 2.20 | 1800 | 152 |

*The noise levels are only a guide as acoustic properties depend on the characteristics of the room, connections, viscosity and resonance.

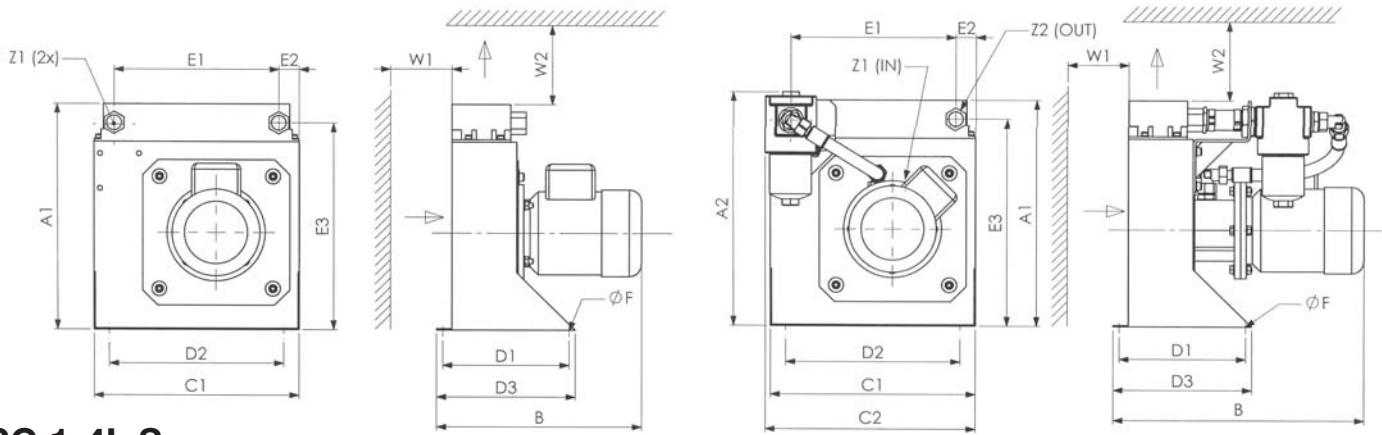
1) 3 Phase Motor

GENERAL

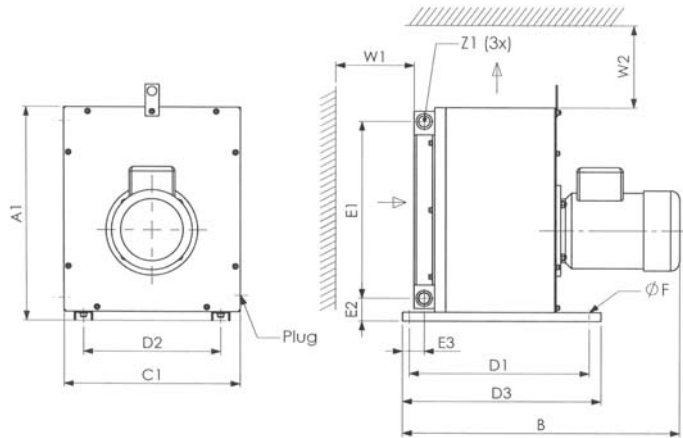
| | | |
|--------------------------------|---------------------------------------|--|
| Construction | Housing | Welded steel housing, steel filter bracket, steel legs, steel blower wheel |
| | Heat Exchanger | Aluminum |
| | Motors | TEFC, IEC Frame B5 Flange |
| | Pump | Aluminum housing, steel inner pump ring, steel rotor, and steel vanes |
| Mounting Position | Horizontal, motor shaft | |
| Maximum Pressure | W/o Pump | 230 PSI (16 BAR) Dynamic 290 PSI (20 BAR) Static |
| | With Pump | 90 PSI (6 BAR)* |
| Rated Suction Pressure | 11.8" Hg (-.4 BAR) to 44 PSI (3 BAR) | |
| Fluids | Mineral oil to DIN 51524 Part 1 and 2 | |
| Contamination Limit | Permissible contamination < NAS 12 | |
| Max Viscosity | W/o Pump | 2000 cst |
| | With Pump | 180 cst |
| Ambient Temperature | 50°F (10°C) to 104°F (40°C) | |
| Maximum Oil Temperature | W/o Pump | 266°F (130°C) |
| | With Pump | 175°F (80°C) |
| Air Flow Direction | Pulled across Heat Exchanger | |

*Note: SCA/SCAF units do not include relief valve. Pressure higher than 90 psi (measured at pump outlet) will result in motor overload conditions.

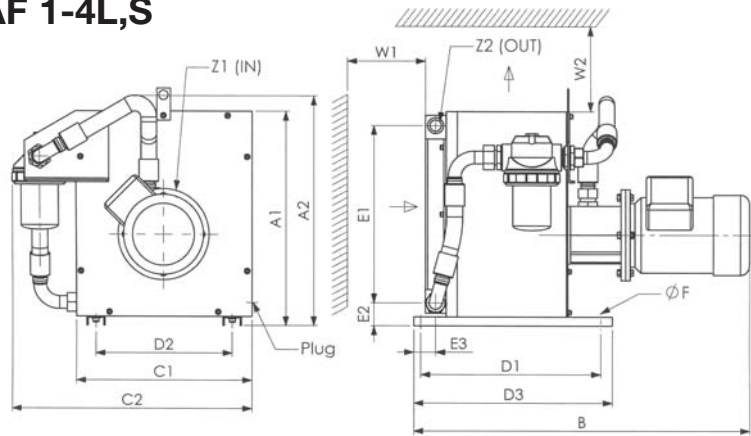
SC 0S



SC 1-4L,S



SCA 1-4L,S - SCAF 1-4L,S



| | A1 | A2 | B | C1 | C2 | D1 | D2 | D3 | E1 | E2 | E3 | F | W1 | W2 | Z1 | Z2 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|------|-------|-------|----------------------|----------------|
| SC-0S | 14.65 | 0.00 | 13.19 | 13.19 | 0.00 | 8.07 | 11.22 | 8.86 | 9.53 | 1.67 | 13.27 | 0.35 | 7.87 | 31.50 | 1 1/16"-12 UNF | 1 1/16"-12 UNF |
| SCA-0S | 14.65 | 0.00 | 16.06 | 13.19 | 0.00 | 8.07 | 11.22 | 8.86 | 9.53 | 1.67 | 13.27 | 0.35 | 7.87 | 31.50 | 3/4"-12 JIC-8(M) | 1 1/16"-12 UNF |
| SCAF-0S | 14.65 | 15.20 | 16.06 | 13.19 | 13.54 | 8.07 | 11.22 | 8.86 | 9.53 | 1.67 | 13.27 | 0.35 | 7.87 | 31.50 | 3/4"-12 JIC-8(M) | 1 1/16"-12 UNF |
| SC-1L,S | 14.76 | 0.00 | 19.88 | 13.58 | 0.00 | 12.60 | 11.22 | 14.17 | 11.38 | 1.97 | 1.87 | 0.35 | 11.81 | 39.37 | 1 1/16"-12 UNF | 1 1/16"-12 UNF |
| SCA-1L,S | 14.76 | 0.00 | 22.68 | 13.58 | 0.00 | 12.60 | 11.22 | 14.17 | 11.38 | 1.97 | 1.87 | 0.35 | 11.81 | 39.37 | 1 1/16"-12 JIC-12(M) | 1 1/16"-12 UNF |
| SCAF-1L,S | 14.76 | 15.35 | 22.68 | 13.58 | 18.70 | 12.60 | 11.22 | 14.17 | 11.38 | 1.97 | 1.87 | 0.35 | 11.81 | 39.37 | 1 1/16"-12 JIC-12(M) | 1 1/16"-12 UNF |
| SC-2L,S | 18.50 | 0.00 | 23.70 | 15.16 | 0.00 | 15.35 | 11.81 | 16.93 | 15.31 | 1.97 | 1.87 | 0.35 | 15.75 | 59.06 | 1 1/16"-12 UNF | 1 1/16"-12 UNF |
| SCA-2L,S | 18.50 | 0.00 | 28.66 | 15.16 | 0.00 | 15.35 | 11.81 | 16.93 | 15.31 | 1.97 | 1.87 | 0.35 | 15.75 | 59.06 | 1 5/16"-12 JIC-16(M) | 1 1/16"-12 UNF |
| SCAF-2L,S | 18.50 | 19.69 | 28.66 | 15.16 | 20.28 | 15.35 | 11.81 | 16.93 | 15.31 | 1.97 | 1.87 | 0.35 | 15.75 | 59.06 | 1 5/16"-12 JIC-16(M) | 1 1/16"-12 UNF |
| SC-3L,S | 20.87 | 0.00 | 28.15 | 17.72 | 0.00 | 18.50 | 14.17 | 19.69 | 17.28 | 2.17 | 2.46 | 0.35 | 19.69 | 78.74 | 1 1/16"-12 UNF | 1 1/16"-12 UNF |
| SCA-3L,S | 20.87 | 0.00 | 33.07 | 17.72 | 0.00 | 18.50 | 14.17 | 19.69 | 17.28 | 2.17 | 2.46 | 0.35 | 19.69 | 78.74 | 1 5/8"-12 JIC-20(M) | 1 1/16"-12 UNF |
| SCAF-3L,S | 20.87 | 22.05 | 33.07 | 17.72 | 23.03 | 18.50 | 14.17 | 19.69 | 17.28 | 2.17 | 2.46 | 0.35 | 19.69 | 78.74 | 1 5/8"-12 JIC-20(M) | 1 1/16"-12 UNF |
| SC-4L,S | 20.87 | 0.00 | 28.15 | 17.72 | 0.00 | 18.50 | 14.17 | 19.69 | 17.28 | 2.17 | 2.13 | 0.35 | 19.69 | 78.74 | 15/16"-12 UNF | 15/16"-12 UNF |
| SCA-4L,S | 20.87 | 0.00 | 33.07 | 17.72 | 0.00 | 18.50 | 14.17 | 19.69 | 17.28 | 2.17 | 2.13 | 0.35 | 19.69 | 78.74 | 1 5/8"-12 JIC-20(M) | 15/16"-12 UNF |
| SCAF-4L,S | 20.87 | 22.05 | 33.07 | 17.72 | 23.03 | 18.50 | 14.17 | 19.69 | 17.28 | 2.17 | 2.13 | 0.35 | 19.69 | 78.74 | 1 5/8"-12 JIC-20(M) | 15/16"-12 UNF |