Oil/air cooler type OAC
Cooling systems

High-performance cooling of hydraulic and lubricating oils

A compact and high-performance cooler series comprising twelve sizes was developed for high-performance cooling of hydraulic and lubricating oils.

Applications:

- Construction machines
- Agricultural machines
- Rail technology
- Machine tools
- Hydraulic power packs
- Wind power
- Hydraulic presses
- Iron and steel industry etc.

Applicable for cooling of:

- Hydraulic oil
- Gear oil
- Lubricating oil
- Water glycol (min. 40 % glycol)

Structure:

- Cooler core (plate and bar) made of aluminium with industrial laminae in black (RAL 9005)
- Fan cover made of steel in black (RAL 9005)
- Fan made of nylon PAG
- Protective grid made of steel in black (RAL 9005)
- Fan 12/24V IP68, 230/400V, 400/690V, IP55
- Fan with hydraulic drive

Marine design:

- Cooler core, frame, fan cover with double-component paint
- Electric motor with special paint and protection class IP56

ATEX design:

- Gas sector: Ⓔx II 2G Ex h IIC T6…T3 Gb X
- Dust sector: Ⓔx II 3D Ex h IIIC T68 °C…110 °C Gb X
- Ambient temperature -40 °C < Ta < +55 °C
- Motor and fan as an adequate ATEX design

Accessories (see page 51 et seqq.):

- Thermal bypass valves
- Oil thermostat valve (OTV)
- Protective grid
- Temperature switch (TSC)
- Speed-controlled operation

The OAC coolers have to be protected from direct solar radiation.

Selection system

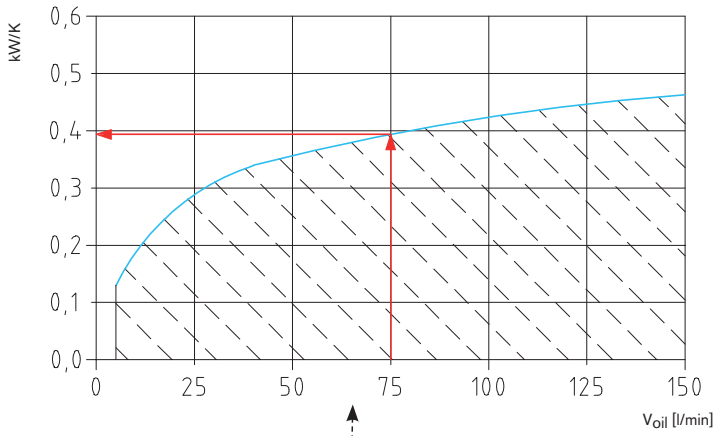
To select the suitable cooler you need to know the following details:

Q [kW]	Heat to be dissipated
V [l/min]	Oil flow
T_{oil} [°C]	Inlet temperature of oil into cooler
T_L [°C]	Inlet temperature of ambient air into cooler

Example of calculation

Details given:
Q = 12 kW
V = 75 l/min
T_{oil} = 65 °C
T_L = 30 °C

Performance diagramme of OAC400



Calculation of specific cooling capacity
Difference of inlet temperature ETD [°C] = T_{oil} - T_L
Specific cooling capacity required $P_{requ.}$ = Q/ETD
The specific cooling capacity required must fall below the performance curve! → 12 kW/(65 °C - 30 °C)= 0.34 kW/°C
The following was selected: OAC400
The actual cooling capacity of the cooler is 0.39 kW/°C x 35 °C = 13.65 kW

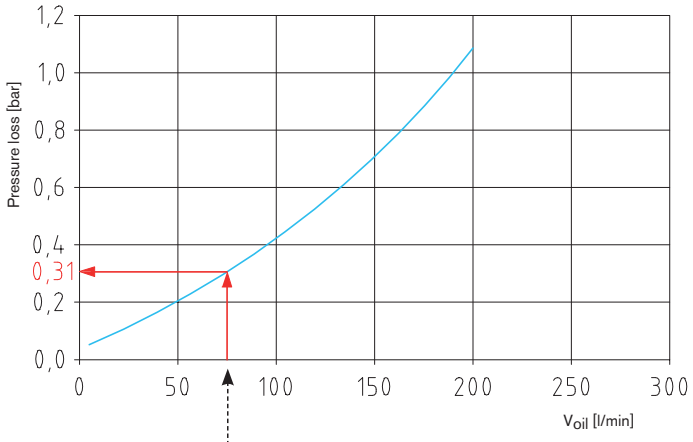
Calculation of pressure loss

The pressure loss in the curves of the different data sheets is based on a viscosity of 30 cSt.
The effective pressure loss is calculated as follows:
Pressure loss (from curve) x factor = effective pressure loss

Example
V_{oil}: 75 l/min
Viscosity: 20 cSt

→ 0.31 bar x 0.75 = 0.233 bar

Pressure loss 30 cSt



Conversion factor of pressure loss

cSt	10	15	20	30	40	50	60	80	100
Factor	0.5	0.65	0.75	1	1.2	1.4	1.6	2.1	2.8