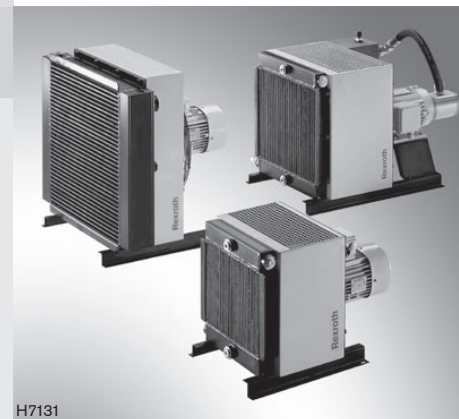


Oil/air coolers

RE 50111/12.06
Replaces: 04.04

1/24

Types KOL and KOLP

Component series 1X
Maximum flow 400 l/min [105 GPM]

H7131

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• Terminal assignment			

Features

- Environmentally friendly, because an exchange between water and the hydraulic fluid is impossible
- Compact design
- Wide field of application
- Large number of variants
- Ready for connection

Possible applications

- Machine tools
- Test rigs
- Presses
- Plastics processing machines / injection moulding machines

Information on available spare parts:
www.boschrexroth.com/spc

Description

Oil/air coolers are used to dissipate heat.

Due to pressure drops in lines and components, energy is released in the hydraulic system in the form of heat. This heat is dissipated into the atmosphere with the help of oil/air coolers. This ensures that the hydraulic fluid temperature can be kept within the optimum temperature range for the hydraulic components.

These oil/air coolers basically consist of an electric motor, housing, cooler element and fan wheel. In the version with radial fan wheel, the oil/air cooler is also available as complete

circulation circuit (built-on external gear pump with or without filter).

The units can be installed vertically or horizontally. For horizontal mounting of the oil/air coolers, four oblong holes are provided on the mounting strips. For mounting in the vertical position, the oblong holes for mounting are provided on the cooler element. See also Unit dimensions.

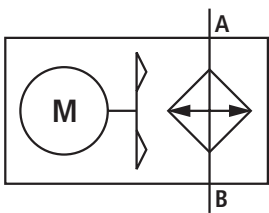
Filters are optionally available with electrical or visual clogging indicator.

☞ When operating the oil/air cooler in a heavily soiled environment, we recommend the use of an oil/air cooler with air filter mat.

Symbols

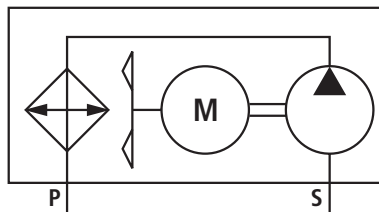
Symbol for oil/air cooler

(Types KOL.../A... and KOL.../R...)



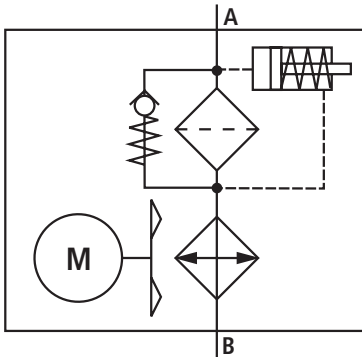
Symbol for oil/air cooler with pump

(Type KOLP.../R...)



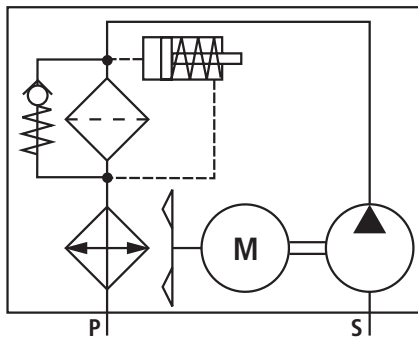
Symbol for oil/air cooler with filter and visual clogging indicator

(Type KOL.../R-F...-O...)



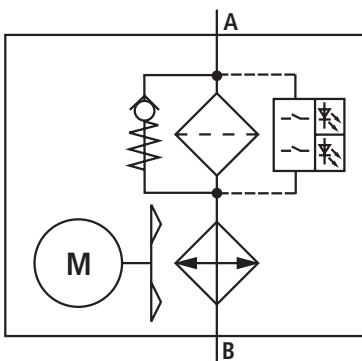
Symbol for oil/air cooler with pump and filter with visual clogging indicator

(Type KOLP.../R-...F...-O...)



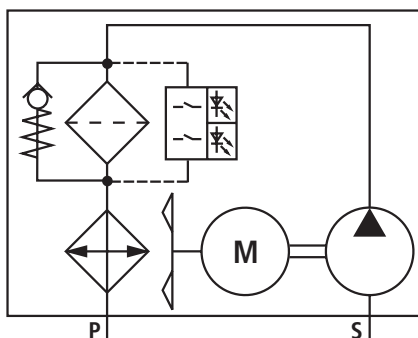
Symbol for oil/air cooler with filter and electrical clogging indicator

(Type KOL.../R-F...-E...)



Symbol for oil/air cooler with pump and filter with electrical clogging indicator

(Type KOLP.../R-...F...-E...)



Ordering code

		-1X/						/M		*
Type of device										Further details in clear text
Oil/air cooler	= KOL									Seal material ²⁾ NBR seal
Oil/air cooler with circulation pump	= KOLP ¹⁾									
Cooling capacity (at q_{Vmax} ; $\Delta t = 40$ K)										Clogging indicator ⁶⁾ E = Electrical clogging indicator O = Visual clogging indicator
3 kW	= 3 ¹⁾									
5 kW	= 5 ¹⁾									Filter rating ⁶⁾ 3 = Filter rating 3 μ m 10 = Filter rating 10 μ m
8 kW	= 8 ¹⁾									
10 kW	= 10 ¹⁾									Filter flow rate ¹⁾ No code = Without filter 100 = max. 100 l/min [26.4 GPM] 160 ⁵⁾ = max. 160 l/min [42.2 GPM]
15 kW	= 15 ⁷⁾									
20 kW	= 20 ⁷⁾									Ancillary equipment ¹⁾ No code = Without ancillary equipment F = With filter B5 = With by-pass, start of opening at 55 °C [131 °F] B6 = With by-pass, start of opening at 65 °C [149 °F] T5 = With temperature switch, switching point 50 °C [122 °F] T6 = With temperature switch, switching point 60 °C [140 °F] L = With air filter ⁹⁾
30 kW	= 30 ⁷⁾									
40 kW	= 40 ⁷⁾									Flow of the circulation pump ¹⁾ No code = Without circulation pump 6 ³⁾ = Flow 6 l/min [1.6 GPM] ⁸⁾ 9 ⁴⁾ = Flow 9 l/min [2.4 GPM] ⁸⁾ 13 ³⁾ = Flow 13 l/min [3.4 GPM] ⁸⁾ 19 ³⁾ = Flow 19 l/min [5.0 GPM] ⁸⁾ 20 ⁴⁾ = Flow 20 l/min [5.3 GPM] ⁸⁾ 30 ³⁾ = Flow 30 l/min [7.9 GPM] ⁸⁾ 45 ⁴⁾ = Flow 45 l/min [12 GPM] ⁸⁾
45 kW	= 45 ⁷⁾									
65 kW	= 65 ⁷⁾									Supply voltage ²⁾ 230/400V-50Hz; 265/460V-60-Hz (3 phases) = N
80 kW	= 80 ⁷⁾									
120 kW	= 120 ⁷⁾									Component series 10 to 19 (10 to 19: unchanged installation and connection dimensions) = 1X
Design principle										
Cooler with axial fan wheel	= A									
Cooler with radial fan wheel	= R									

¹⁾ Only in conjunction with radial fan wheel

²⁾ Others on request

³⁾ Only in conjunction with 3 and 8 kW cooling capacity

⁴⁾ Only in conjunction with 5 and 10 kW cooling capacity

⁵⁾ Only in conjunction with 8 and 10 kW cooling capacity

⁶⁾ Only in conjunction with filter

⁷⁾ Only in conjunction with axial fan wheel

⁸⁾ Flow data valid at $f = 50$ Hz; at $f = 60$ Hz the flow increases by approx. 20 % .

⁹⁾ Due to the air filter mat (clean), the cooling capacity reduces by approx. 10 %. In the vertical installation position, the oil/air cooler cannot be placed on the cooler element.

Order example: Type KOL45N-1X/A-B5T5L/M

Oil/air cooler	KOL
Cooling capacity (at q_{Vmax} ; $\Delta t = 40$ °C [40 °K]), 45kW	45
Supply voltage, 230/400V-50Hz, 265/460V-60Hz	N
Design principle, axial fan wheel	A
Ancillary equipment:	B5T5L
- Start of by-pass opening at 55 °C [131 °F]	
- Temperature switch switching point 50 °C [122 °F]	
- Air filter	
Seal material NBR	M

Technical data (for applications outside these parameters, please consult us!)

General		
Direction of rotation (fan wheel)		Anti-clockwise
Installation position		Horizontal and vertical
Hydraulic		
Operating pressure max.	bar [psi]	26 [377]
Hydraulic fluid		Mineral oil (HLP) to DIN 51524, part 2 Please observe our regulations laid down in data sheet RE 07075!
Hydraulic fluid temperature range	°C [°F]	-20 to +80 [-4 to +176]
Permissible max. degree of contamination of the hydraulic fluid Cleanliness class to ISO 4406 (c)		Class 21/19/16 ^{1, 2)}
Viscosity range	mm ² /s [SUS]	2000 [9280] ¹⁾

¹⁾ Not valid for versions KOLP.../R... and KOLP.../R-...F...
(see below).

²⁾ The cleanliness classes given for components must be adhered to in the hydraulic system. Effective filtration prevents malfunction and, at the same time, prolongs the service life of the components.

Air flow rate

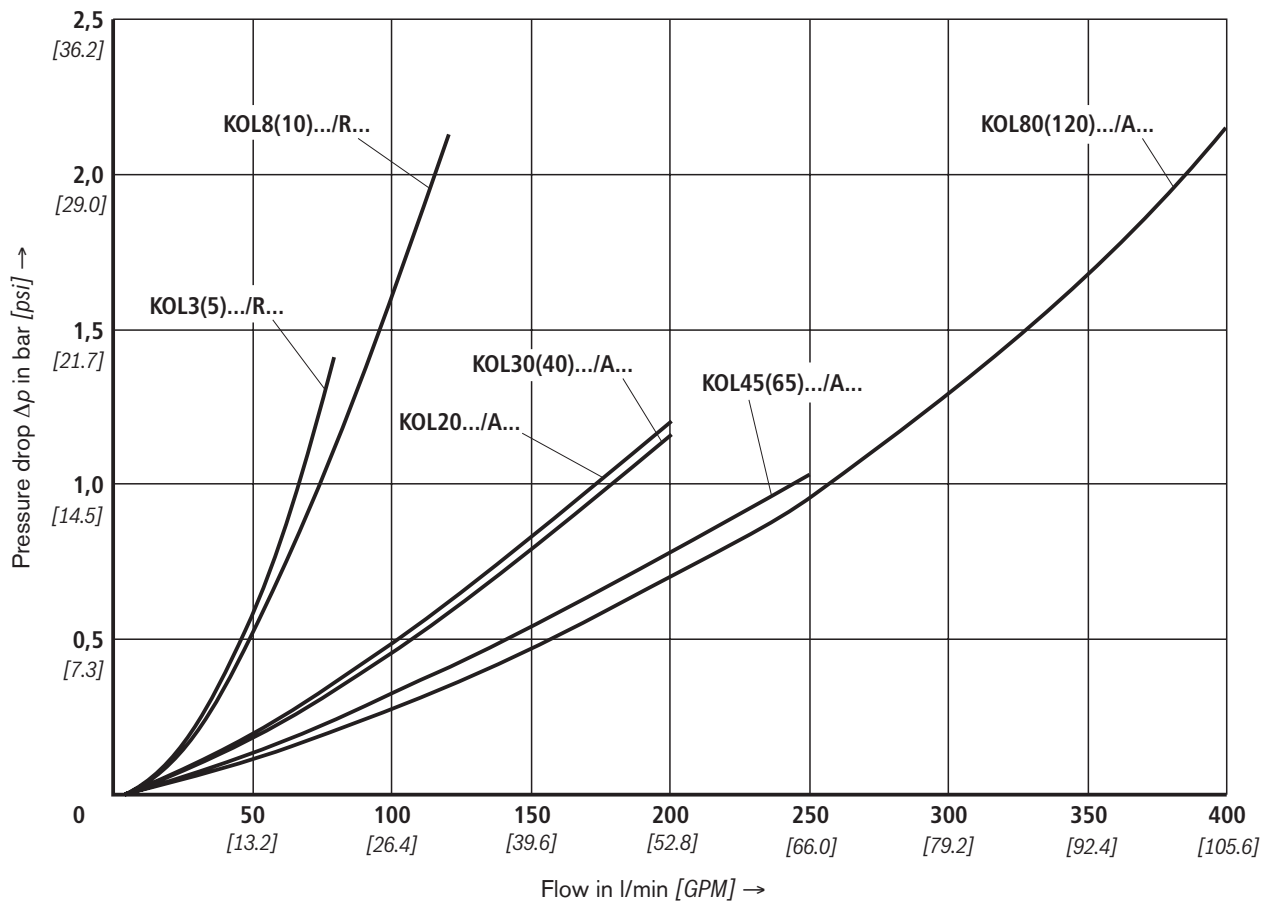
Air flow rate in m ³ /h [cu yd/h]	Type	50Hz / 60Hz
	KOL (P) 3	
KOL(P) 5		820 [1070] / 980 [1280]
KOL(P) 8		730 [960] / 930 [1220]
KOL(P) 10		1520 [1990] / 1820 [2380]
KOL 15		2180 [2850] / 2610 [3410]
KOL 20		3220 [4210] / 3860 [5050]
KOL 30		3600 [4710] / 4320 [5650]
KOL 40		5330 [6970] / 6400 [8370]
KOL 45		7000 [9160] / 8400 [10990]
KOL 65		10000 [13080] / 12000 [15700]
KOL 80		11720 [15330] / 14060 [18390]
KOL 120		17170 [22460] / 20520 [26840]

Supplementary technical data for versions KOLP.../R... and KOLP.../R-...F...

General		
Direction of rotation (pump)		Clockwise
Suction height max.	m [ft]	0.8 [2.62]
Hydraulic		
Permissible max. degree of contamination of the hydraulic fluid Cleanliness class to ISO 4406 (c)		Class 18/16/12 ²⁾
Viscosity range	mm ² /s [SUS]	12 to 100 [55 to 464]

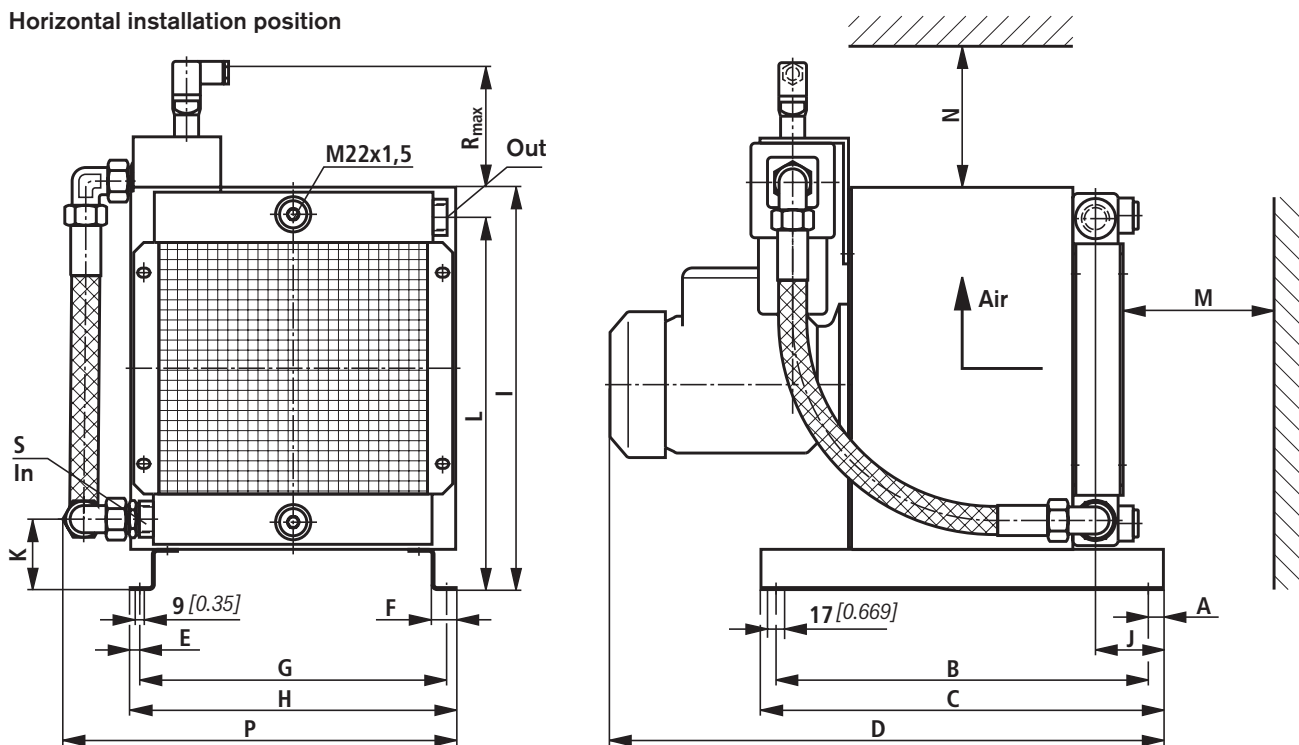
²⁾ The cleanliness classes given for components must be adhered to in the hydraulic system. Effective filtration prevents malfunction and, at the same time, prolongs the service life of the components.

Δp - q_v characteristic curves (cooler element, measured at $v = 30 \text{ mm}^2/\text{s}$ [141 SUS] and $\vartheta = 50 \text{ }^\circ\text{C}$ [122 $^\circ\text{F}$])



Unit dimensions: Type KOL.../R-(F)... (nominal dimensions in mm [inch])

Horizontal installation position



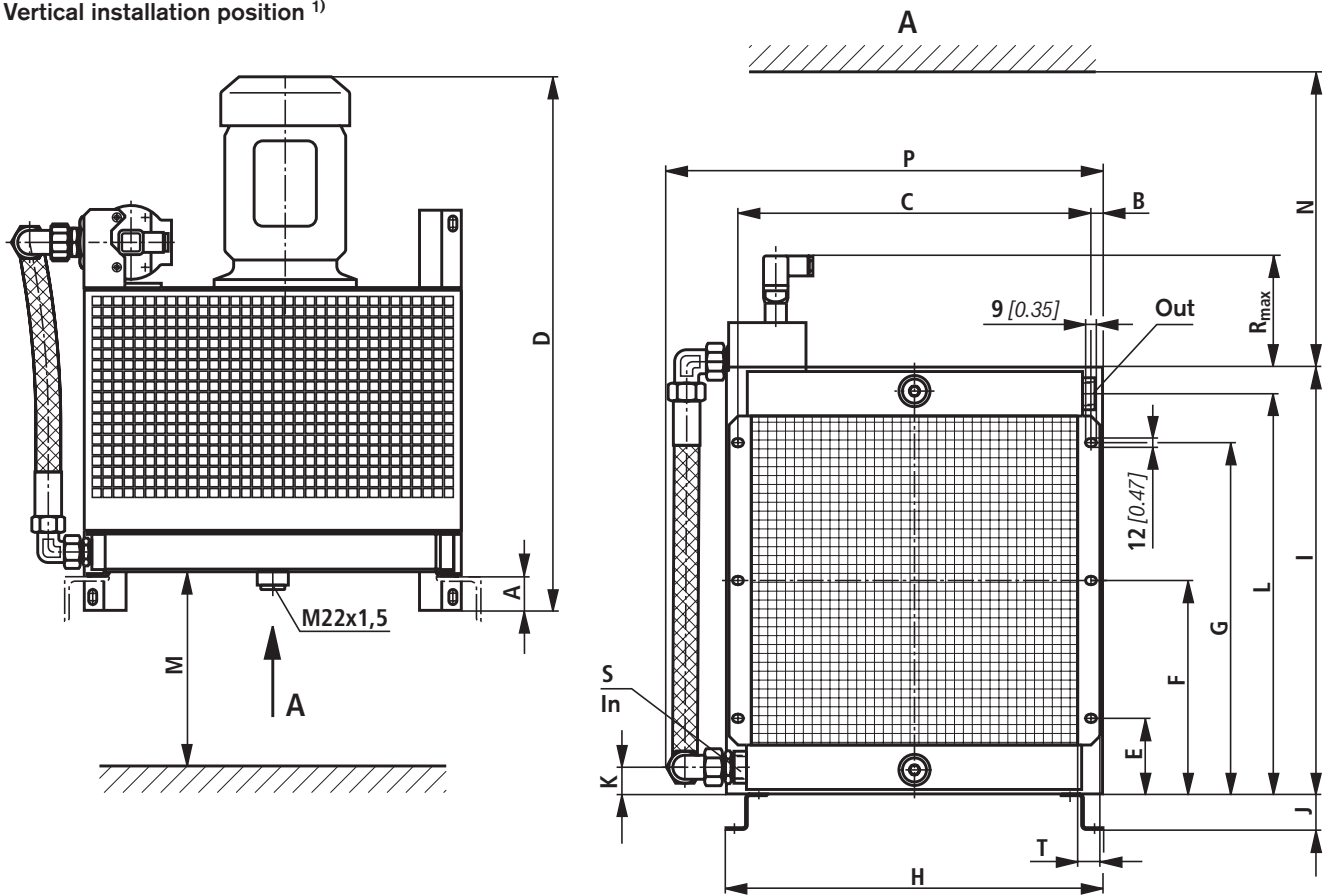
Cooler type	A ¹⁾	B ¹⁾	C	D	E	F	G	H	I	J	K
KOL3(5).../R...	15	370	400	521	9,5	24	305	324	400	66	70
KOL3(5).../R-F100...	[0.59]	[14.5]	[15.7]	[20.5]	[0.37]	[0.94]	[12]	[12.7]	[15.7]	[2.59]	[2.75]
KOL8(10).../R...	15	420	450	571	9,5	24	405	424	500	66	70
KOL8(10).../R-F100...	[0.59]	[16.5]	[17.7]	[22.4]	[0.37]	[0.94]	[15.9]	[16.7]	[19.6]	[2.59]	[2.75]
KOL8(10).../R-F160...											

Cooler type	L	M	N	P	R _{max}	S	Sound pressure level in dB (A) ²⁾		Weight in kg [lbs]
							f = 50Hz	f = 60Hz	
KOL3(5).../R...	370 [14.5]	150 [5.9]	200 [7.9]	420 [16.54]	-	G 3/4	52 (62)	57 (65)	23.0 [50.6]
KOL3(5).../R-F100...				430 [16.9]	127 [5]				25.5 [56.2]
KOL8(10).../R...	470 [18.5]	200 [7.9]	250 [9.8]	165 [6.5]	-	G 3/4	55 (65)	60 (70)	32.0 [70.5]
KOL8(10).../R-F100...				530 [20.9]	113 [4.44]				34.5 [76]
KOL8(10).../R-F160...				78 [3.07]					36.5 [80.4]

¹⁾ Dimension to the centre of the oblong hole ²⁾ According to DIN 45635

Unit dimensions: Type KOL.../R-(F)... (nominal dimensions in mm [inch])

Vertical installation position ¹⁾



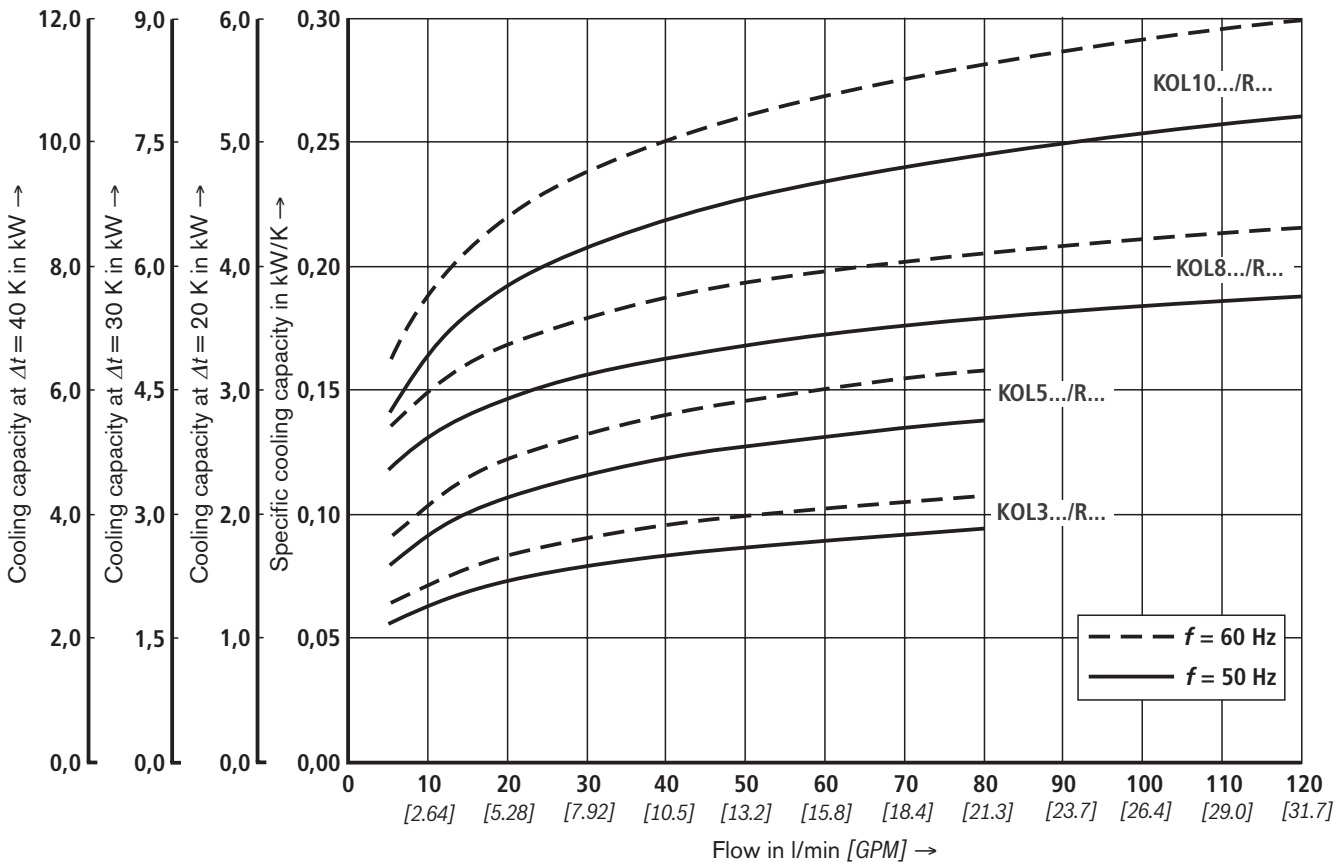
Cooler type	A	B	C	D	E	F	G	H	I	J	K
KOL3(5).../R...	38.5	13	297	521	85	275	-	324	360	40	30
KOL3(5).../R-F100...	[1.51]	[0.51]	[11.7]	[20.5]	[3.34]	[10.8]		[12.7]	[14.2]	[1.57]	[1.18]
KOL8(10).../R...	38.5	13.5	397	571	75	230	385	424	460	40	30
KOL8(10).../R-F100...	[1.51]	[0.53]	[15.6]	[22.4]	[2.95]	[9.05]	[15.1]	[16.7]	[18.1]	[1.57]	[1.18]
KOL8(10).../R-F160...											

Cooler type	L	M	N	P	R _{max}	S	T	Sound pressure level in dB (A) ²⁾		Weight in kg [lbs]
								f = 50Hz	f = 60 Hz	
KOL3(5).../R...	330 [12.9]	150 [5.9]	200 [7.9]	-	-	G 3/4	25 [0.98]	52 (62)	57 (65)	23.0 [50.6]
KOL3(5).../R-F100...				430 [16.9]	127 [5]					25.5 [56.2]
KOL8(10).../R...	430 [16.9]	200 [7.9]	250 [9.8]	-	-	G 3/4	25 [0.98]	55 (65)	60 (70)	32.0 [70.5]
KOL8(10).../R-F100...				530 [20.9]	113 [4.44]					34.5 [76]
KOL8(10).../R-F160...				78 [3.07]	36.5 [80.4]					

¹⁾ With ancillary equipment with air filter, the oil/air cooler cannot be placed on the cooler element!

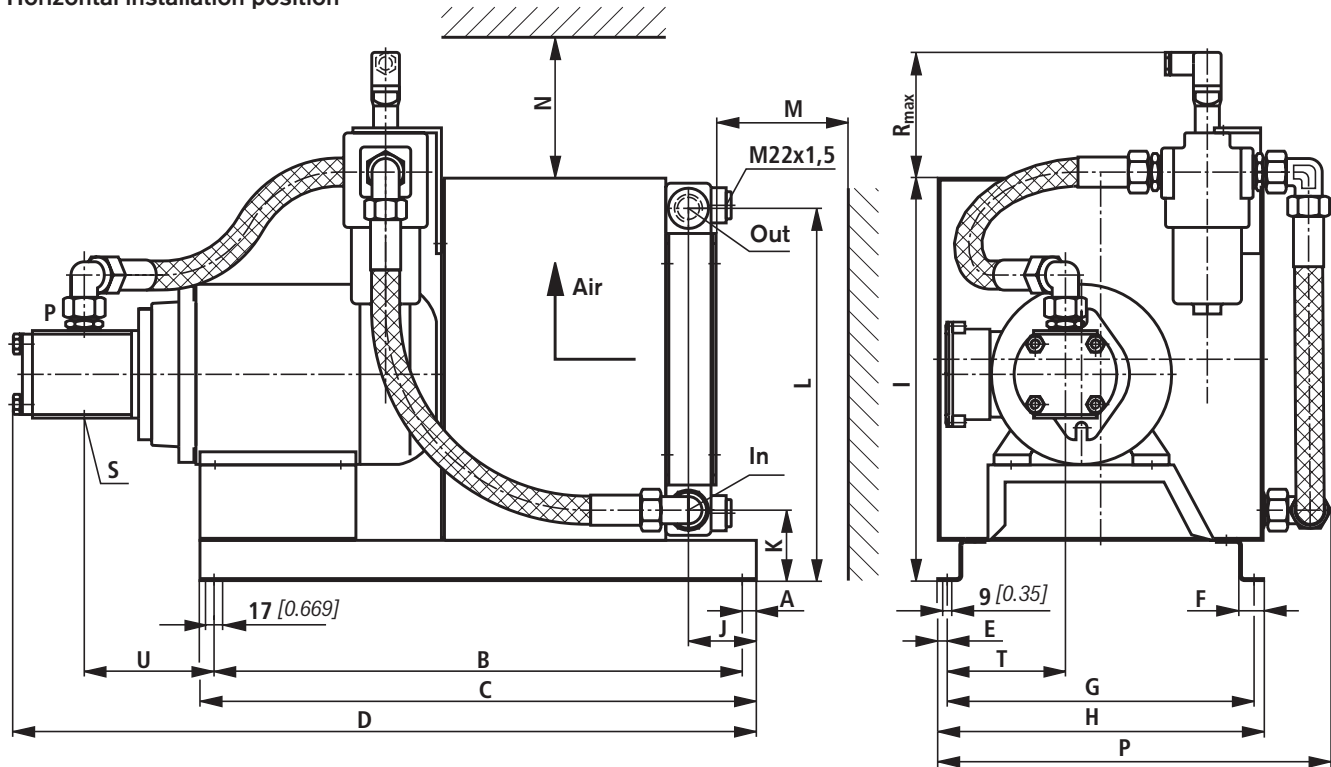
²⁾ According to DIN 45635

Cooling capacity to DIN EN 1048: Type KOL.../R...



Unit dimensions: Type KOLP.../R...(F)... (nominal dimensions in mm [inch])

Horizontal installation position



Unit dimensions: Type KOLP.../R...(F)... (nominal dimensions in mm [inch])

Horizontal installation position

Cooler type	A ¹⁾	B ¹⁾	C	D	E	F	G	H	I	J	K	L
KOLP3.../R-6...	15 [0.59]	525 [20.6]	555 [21.8]	700.5 [27.5]	9.5 [0.37]	24 [0.94]	305 [12]	324 [16.6]	400 [15.7]	68 [2.59]	70 [2.75]	370 [14.5]
KOLP5.../R-9...												
KOLP3.../R-13...				712.5 [28]								
KOLP5.../R-20...												
KOLP3.../R-19...				722.5 [28.4]								
KOLP5.../R-30...												
KOLP3.../R-30...				740.5 [29.1]								
KOLP5.../R-45...												
KOLP3(5).../R-...F100...				-								
KOLP8.../R-6...	15 [0.59]	575 [22.6]	605 [23.8]	750.5 [29.5]	9.5 [0.37]	24 [0.94]	405 [15.9]	424 [16.6]	500 [19.6]	68 [2.59]	70 [2.75]	470 [18.5]
KOLP10.../R-9...												
KOLP8.../R-13...				762.5 [30]								
KOLP10.../R-20...												
KOLP8.../R-19...				772.5 [30.4]								
KOLP10.../R-30...												
KOLP8.../R-30...				790.5 [31]								
KOLP10.../R-45...												
KOLP8(10).../R-...F100...				-								
KOLP8(10).../R-...F160...												

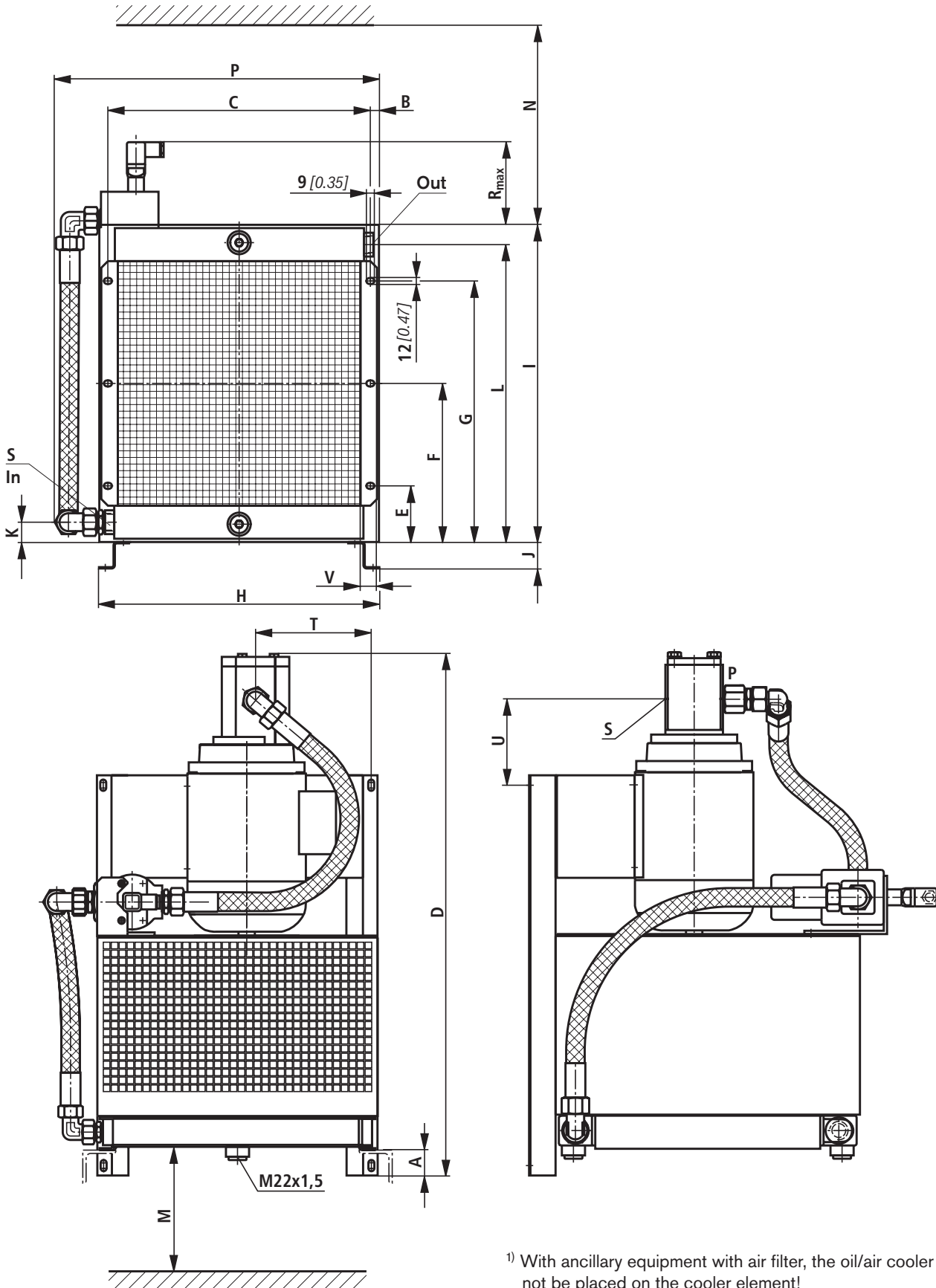
Cooler type	M	N	P	R _{max}	S	T	U	Sound pressure level in dB (A) ²⁾		Weight in kg [lbs]	
								f = 50Hz	f = 60Hz		
KOLP3.../R-6...	150 [5.9]	200 [7.87]	430 [16.9]	-	G1/2	117,5 [4.62]	110 [4.3]	63	69	34.4 [75.8]	
KOLP5.../R-9...								65	70	38.0 [83.7]	
KOLP3.../R-13...								116 [4.5]	63	69	34.7 [76.4]
KOLP5.../R-20...									71	74	38.3 [84.4]
KOLP3.../R-19...					121 [4.7]		65	72	35.0 [77.1]		
KOLP5.../R-30...										73	76
KOLP3.../R-30...					130 [5.1]		71	75	35.4 [78.0]		
KOLP5.../R-45...										78	83
KOLP3(5).../R-...F100...				127 [5]	-		-	-	37.9 [83.5] (41.5 [91.4])		
KOLP8.../R-6...	200 [7.87]	250 [9.84]	530 [20.9]	-	G1/2	172.5 [6.79]	110 [4.3]	62	65	42.9 [94.5]	
KOLP10.../R-9...								69	72	46.5 [102.4]	
KOLP8.../R-13...								116 [4.5]	64	68	43.2 [95.2]
KOLP10.../R-20...									69	72	46.8 [103.1]
KOLP8.../R-19...					121 [4.7]		68	70	43.5 [95.8]		
KOLP10.../R-30...										72	76
KOLP8.../R-30...					130 [5.1]		70	72	43.9 [96.7]		
KOLP10.../R-45...										78	83
KOLP8(10).../R-...F100...				113 [4.44]	-		-	-	46.4 [102.2] (50.0 [110])		
KOLP8(10).../R-...F160...				78 [3]	-		-	-	48.4 [106.6] (52.0 [114.6])		

¹⁾ Dimension to the centre of the oblong hole

²⁾ According to DIN 45635

Unit dimensions: Type KOLP.../R...(F)... (nominal dimensions in mm [inch])

Vertical installation position ¹⁾



¹⁾ With ancillary equipment with air filter, the oil/air cooler cannot be placed on the cooler element!

Unit dimensions: Type KOLP.../R...(F)... (nominal dimensions in mm [inch])

Vertical installation position

Cooler type	A	B	C	D	E	F	G	H	I	J	K	L
KOLP3.../R-6...	40.5 [1.59]	13 [0.51]	297 [11.7]	700.5 [27.5]	85 [3.34]	275 [10.8]	-	324 [12.7]	360 [14]	40 [1.57]	30 [1.18]	330 [12.9]
KOLP5.../R-9...												
KOLP3.../R-13...				712.5 [28]								
KOLP5.../R-20...				722.5 [28.4]								
KOLP3.../R-19...				740.5 [29.1]								
KOLP5.../R-30...				-								
KOLP3.../R-30...												
KOLP5.../R-45...												
KOLP3(5).../R-...F100...												
KOLP8.../R-6...	40.5 [1.59]	13.5 [0.53]	397 [15.6]	750.5 [29.5]	75 [2.9]	230 [9]	385 [15]	424 [16.6]	460 [18.1]	40 [1.57]	30 [1.18]	430 [16.9]
KOLP10.../R-9...												
KOLP8.../R-13...				762.5 [30]								
KOLP10.../R-20...				772.5 [30.4]								
KOLP8.../R-19...				790.5 [31]								
KOLP10.../R-30...				-								
KOLP8.../R-30...												
KOLP10.../R-45...												
KOLP8(10).../R-...F100...												
KOLP8(10).../R-...F160...												

Cooler type	M	N	P	R _{max}	S	T	U	V	Sound pressure level in dB (A) ¹⁾		Weight in kg [lbs]
									f = 50Hz	f = 60Hz	
KOLP3.../R-6...	150 [5.9]	200 [7.87]	430 [16.9]	-	G1/2	117.5 [4.62]	110 [4.3]	25 [0.9]	63	69	34.4 [75.8]
KOLP5.../R-9...									65	70	38.0 [83.7]
KOLP3.../R-13...									63	69	34.7 [76.4]
KOLP5.../R-20...									71	74	38.3 [84.4]
KOLP3.../R-19...					65		72		35.0 [77.1]		
KOLP5.../R-30...					73		76		38.6 [85.0]		
KOLP3.../R-30...					71		75		35.4 [78.0]		
KOLP5.../R-45...					78		83		39.0 [85.9]		
KOLP3(5).../R-...F100...				127 [5]	-		-		-	-	37.9 [83.5] (41.5 [91.4])
KOLP8.../R-6...	200 [7.87]	250 [9.84]	530 [20.9]	-	G1/2	172.5 [6.79]	110 [4.3]	25 [0.9]	62	65	42.9 [94.5]
KOLP10.../R-9...									69	72	46.5 [102.4]
KOLP8.../R-13...									64	68	43.2 [95.2]
KOLP10.../R-20...									69	72	46.8 [103.1]
KOLP8.../R-19...					68		70		43.5 [95.8]		
KOLP10.../R-30...					72		76		47.1 [103.8]		
KOLP8.../R-30...					70		72		43.9 [96.7]		
KOLP10.../R-45...					78		83		47.5 [104.7]		
KOLP8(10).../R-...F100...				113 [4.44]	-		-		-	-	46.4 [102.2] (50.0 [110])
KOLP8(10).../R-...F160...				78 [3]	-		-		-	-	48.4 [106.6] (52.0 [114.6])

¹⁾ According to DIN 45635

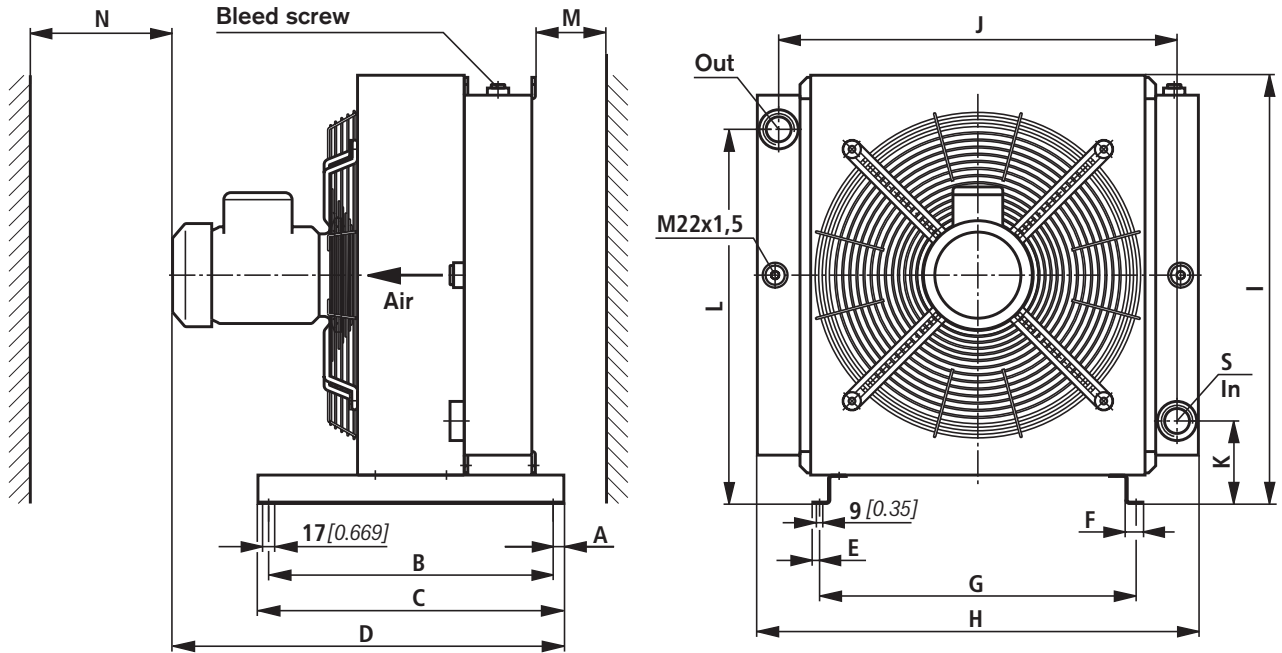
Cooling capacity: Type KOLP.../R...(F)...

Cooler type	Specific cooling capacity in kW/K		Cooling capacity at $\Delta t = 20\text{ °C}$ in kW ¹⁾		Cooling capacity at $\Delta t = 30\text{ °C}$ in kW ¹⁾		Cooling capacity at $\Delta t = 40\text{ °C}$ in kW ¹⁾	
	$f = 50\text{ Hz}$	$f = 60\text{ Hz}$	$f = 50\text{ Hz}$	$f = 60\text{ Hz}$	$f = 50\text{ Hz}$	$f = 60\text{ Hz}$	$f = 50\text{ Hz}$	$f = 60\text{ Hz}$
KOLP3.../R-6...	0.056	0.065	1.1	1.3	1.7	2.0	2.2	2.6
KOLP5.../R-9...	0.088	0.101	1.8	2.0	2.6	3.0	3.5	4.0
KOLP3.../R-13...	0.066	0.076	1.3	1.5	2.0	2.3	2.6	3.0
KOLP5.../R-20...	0.106	0.121	2.1	2.4	3.2	3.6	4.2	4.8
KOLP3.../R-19...	0.073	0.084	1.5	1.7	2.2	2.5	2.9	3.4
KOLP5.../R-30...	0.115	0.132	2.3	2.6	3.5	4.0	4.6	5.2
KOLP3.../R-30...	0.078	0.089	1.6	1.8	2.3	2.6	3.1	3.6
KOLP5.../R-45...	0.125	0.143	2.5	2.9	3.8	4.3	5.0	5.7
KOLP3(5).../R...F100...	–	–	–	–	–	–	–	–
KOLP8.../R-6...	0.120	0.138	2.4	2.8	3.6	4.1	4.8	5.5
KOLP10.../R-9...	0.160	0.184	3.2	3.7	4.8	5.5	6.4	7.4
KOLP8.../R-13...	0.135	0.155	2.7	3.1	4.1	4.7	5.4	6.2
KOLP10.../R-20...	0.190	0.218	3.8	4.4	5.7	6.5	7.6	8.7
KOLP8.../R-19...	0.145	0.166	2.9	3.3	4.4	5.0	5.8	6.6
KOLP10.../R-30...	0.207	0.238	4.1	4.7	6.2	7.1	8.3	9.5
KOLP8.../R-30...	0.156	0.179	3.1	3.6	4.7	5.4	6.2	7.1
KOLP10.../R-45...	0.221	0.254	4.4	5.0	6.6	7.6	8.8	10.1
KOLP8(10).../R...F100...	–	–	–	–	–	–	–	–
KOLP8(10).../R...F160...	–	–	–	–	–	–	–	–

¹⁾ Values rounded

Unit dimensions: Type KOL15-40.../A... (nominal dimensions in mm [inch])

Horizontal installation position



Cooler type	A ¹⁾	B ¹⁾	C	D	E	F	G	H	I	J	K	L
KOL15.../A...	15	400	430	542	9.5	24	445	620	602	560	114.5	527.5
KOL20.../A...	[0.59]	[15.7]	[16.9]	[21.3]	[0.37]	[0.94]	[17.5]	[24.4]	[23.7]	[22]	[4.5]	[20.7]
KOL30.../A...	15	400	430	542	9.5	24	595	770	749	710	109.5	679.5
KOL40.../A...	[0.59]	[15.7]	[16.9]	[21.3]	[0.37]	[0.94]	[23.4]	[30.3]	[29.4]	[27.9]	[4.31]	[26.7]

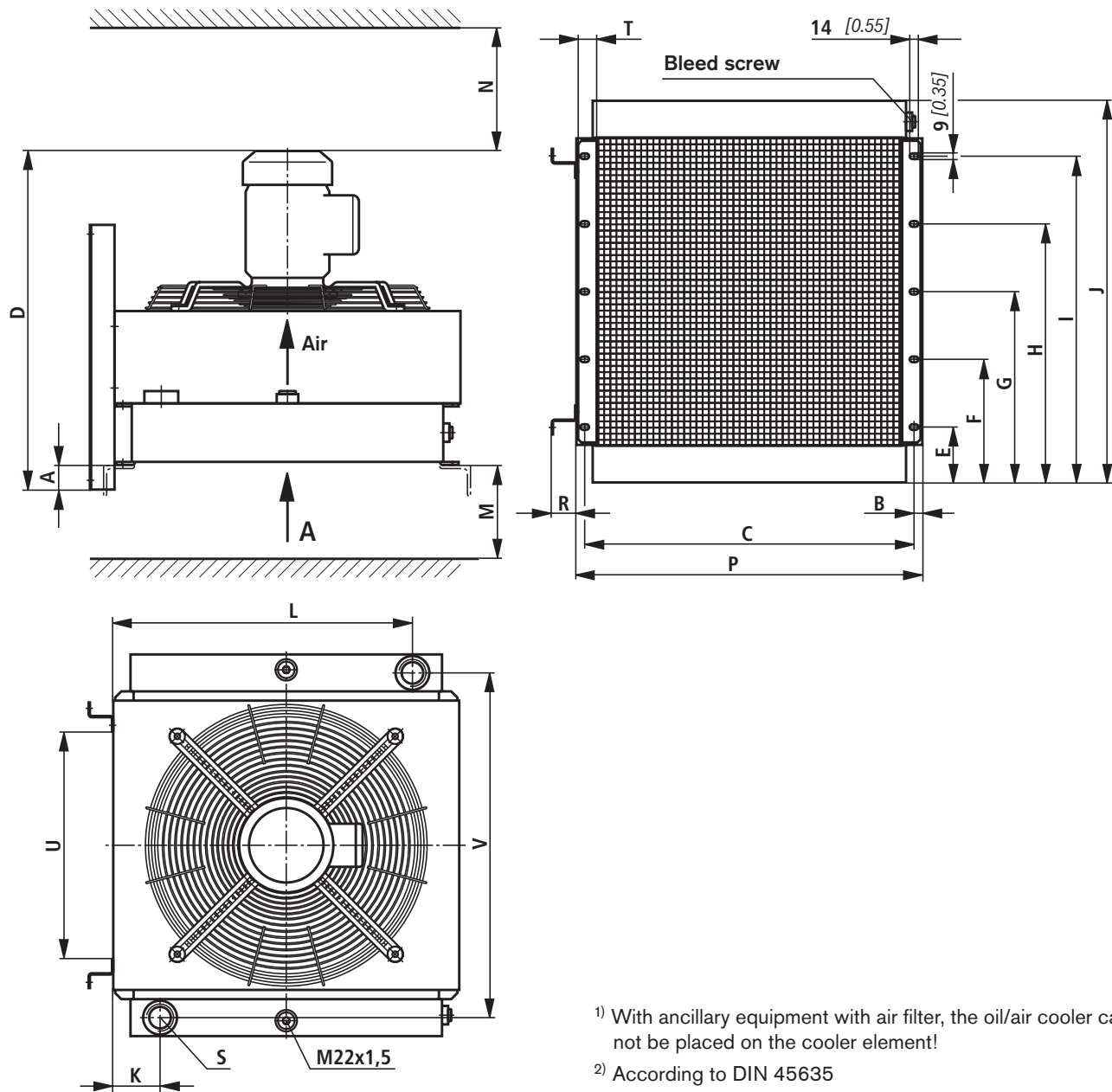
Cooler type	M	N	S	Sound pressure level in dB (A) ²⁾		Weight in kg [lbs]
				f = 50Hz	f = 60Hz	
KOL15.../A...	500 [19.7]	800 [31.5]	G1 1/4	62	68	49.0 [107.9]
KOL20.../A...				73	78	
KOL30.../A...	800 [31.49]	2100 [82.6]	G1 1/4	69	76	66.5 [146.5]
KOL40.../A...				79	83	

¹⁾ Dimension to the centre of the oblong hole

²⁾ According to DIN 45635

Unit dimensions: Type KOL15-40.../A... (nominal dimensions in mm [inch])

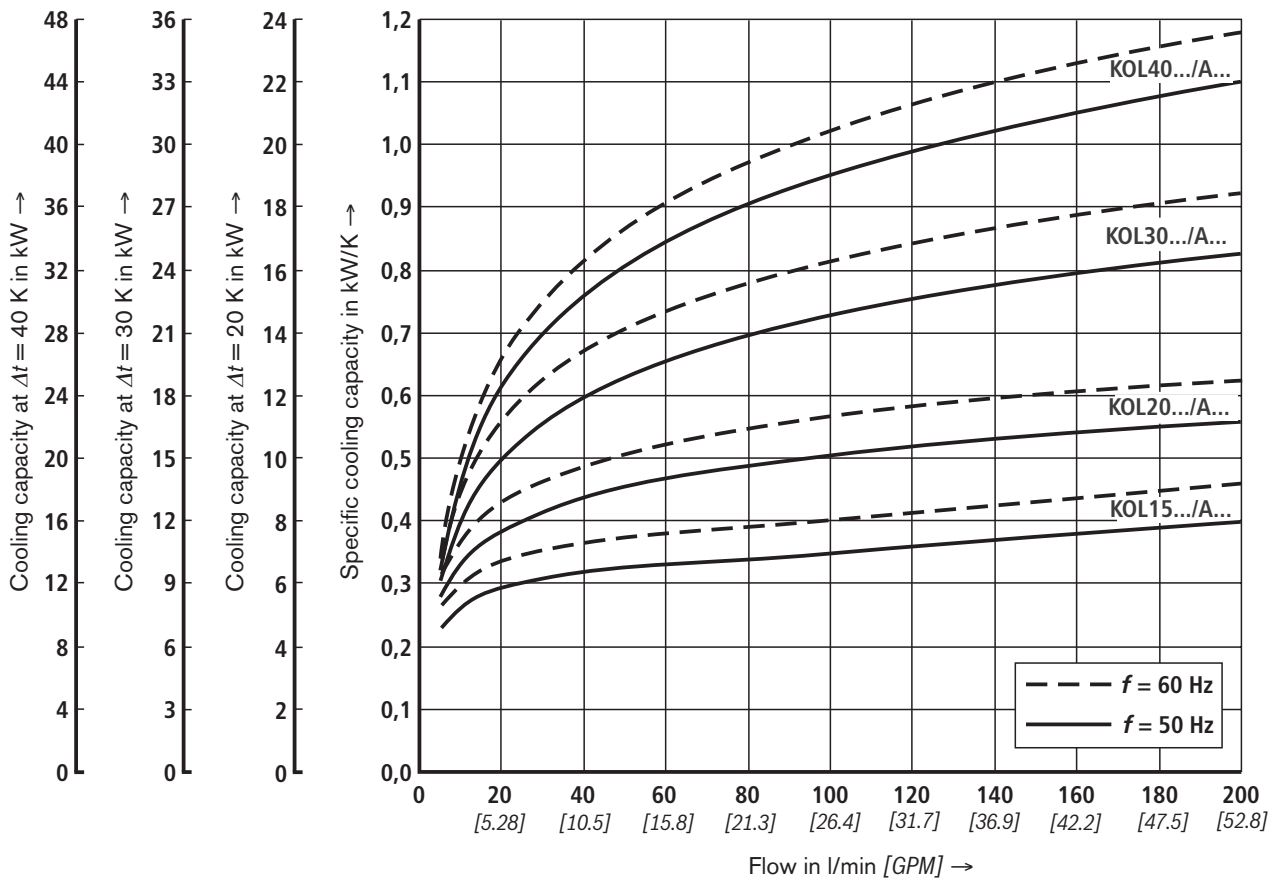
Vertical installation position ¹⁾



Cooler type	A	B	C	D	E	F	G	H	I	J	K	L
KOL15.../A...	38.5	13.5	535	542	90	235	385	530	-	620	74.5	487.5
KOL20.../A...	[1.51]	[0.531]	[16.9]	[21.3]	[3.54]	[9.25]	[15.1]	[20.8]	-	[24.4]	[2.93]	[19.1]
KOL30.../A...	38.5	14.5	680	542	95	240	385	530	675	770	69.5	639.5
KOL40.../A...	[1.51]	[0.57]	[16.9]	[21.3]	[3.74]	[9.44]	[15.1]	[20.8]	[26.5]	[30.3]	[2.73]	[25.1]

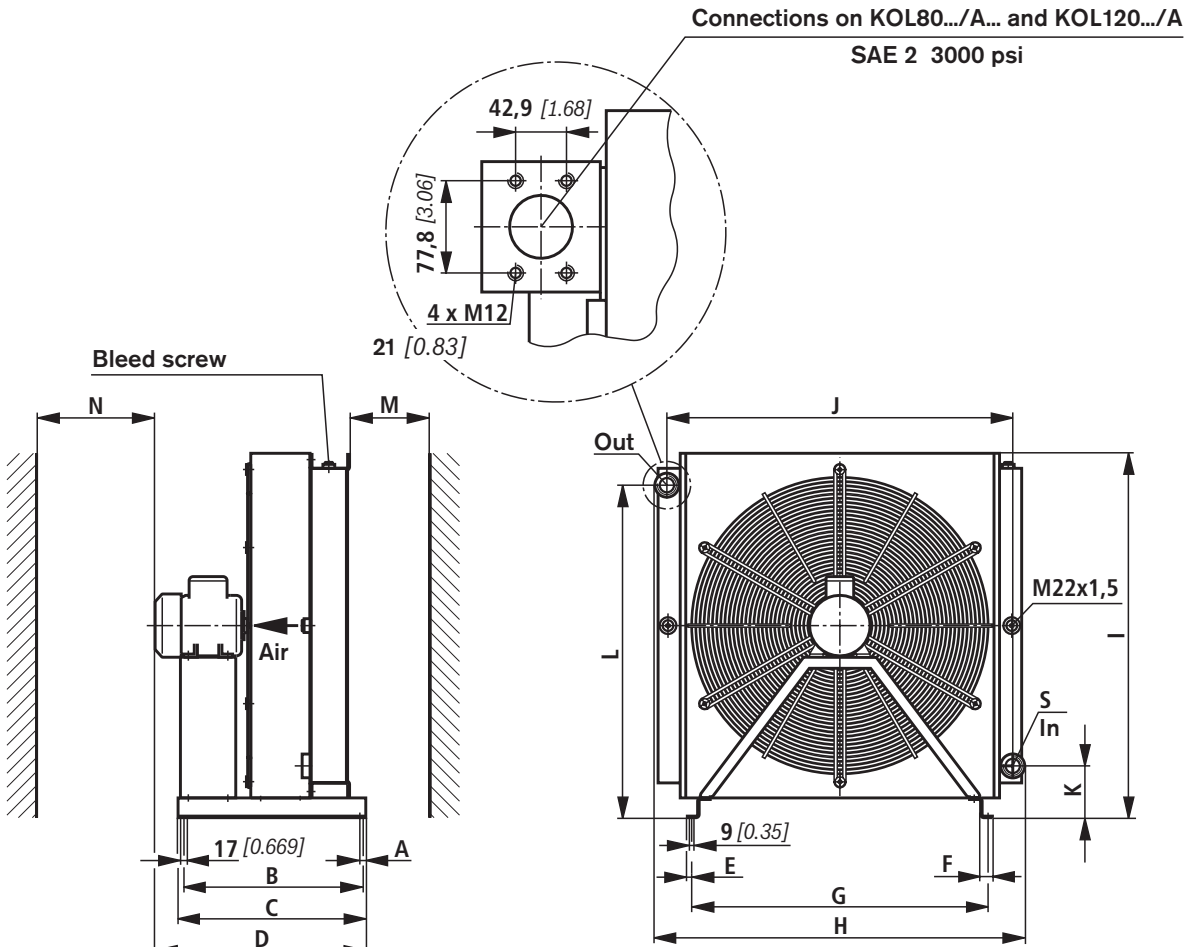
Cooler type	M	N	P	R	S	T	U	V	Sound pressure level in dB (A) ²⁾		Weight in kg [lbs]
									f = 50Hz	f = 60Hz	
KOL15.../A...	500	800	562	40	G1 1/4	30	370	560	62	68	49.0 [107.9]
KOL20.../A...	[19.7]	[31.5]	[22.1]	[1.57]		[1.18]	[14.5]	[22]	73	78	
KOL30.../A...	800	2100	709	40	G1 1/4	30	520	710	69	76	66.5 [146.5]
KOL40.../A...	[31.49]	[82.6]	[27.9]	[1.57]		[1.18]	[20.4]	[27.9]	79	83	

Cooling capacity to DIN EN 1048: Type KOL15-40.../A...



Unit dimensions: Type KOL45-120.../A... (nominal dimensions in mm [inch])

Horizontal installation position



Cooler type	A ¹⁾	B ¹⁾	C	D	E	F	G	H	I	J	K	L
KOL45.../A...	15	470	500	573	11	30	750	935	922	875	131	841
KOL65.../A...	[0.59]	[18,5]	[19.6]	[22.5]	[0.43]	[1.18]	[29.5]	[36.8]	[36.2]	[34.4]	[5.15]	[33.1]
KOL80.../A...	15	520	550	615	11	30	960	1200	1147	1100	148	1048
KOL120.../A...	[0.59]	[20.4]	[21.6]	[24.2]	[0.45]	[1.18]	[37.7]	[47.2]	[45.1]	[43.3]	[5.82]	[41.2]

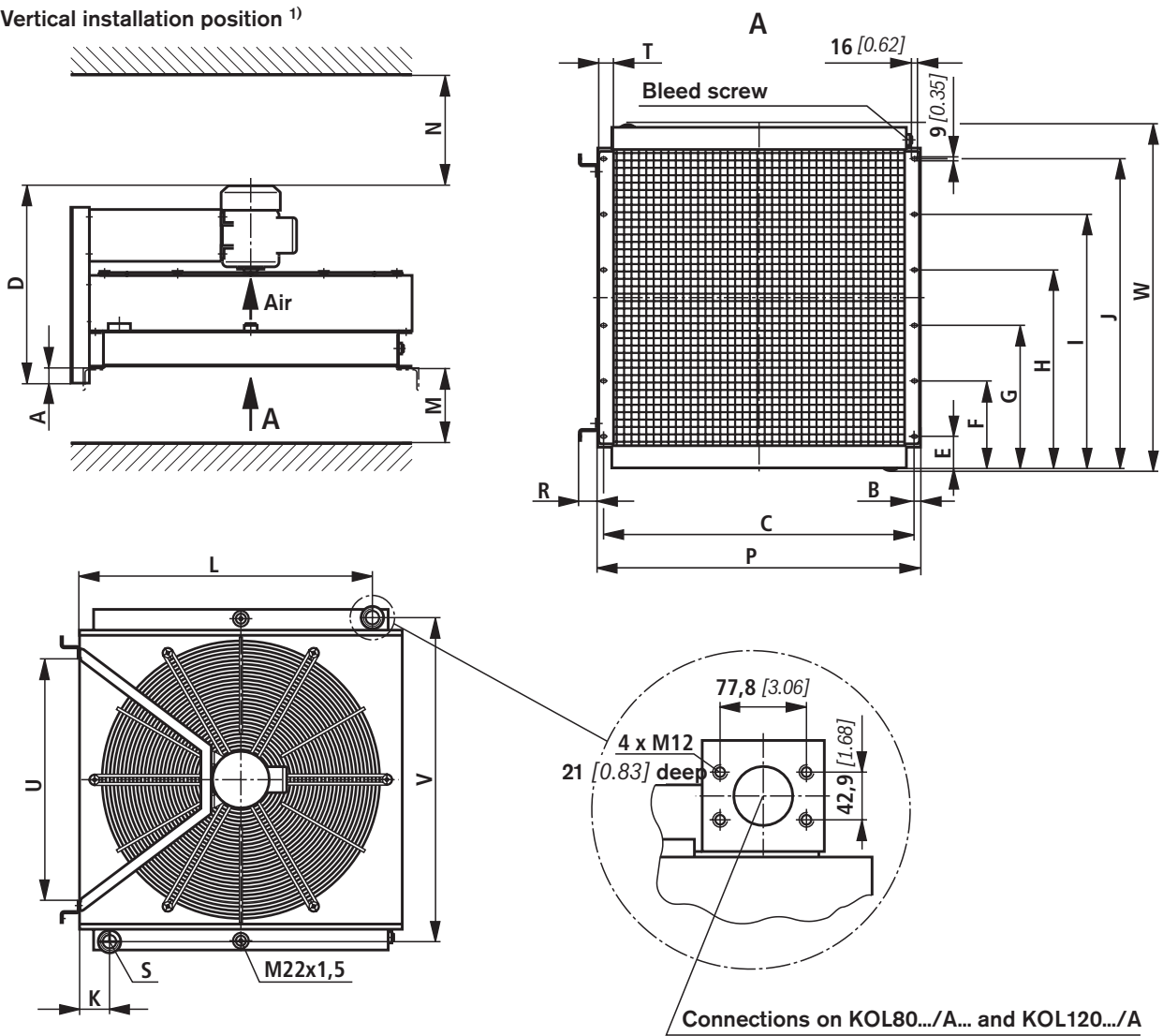
Cooler type	M	N	S	Sound pressure level in dB (A) ²⁾		Weight in kg [lbs]
				f = 50Hz	f = 60Hz	
KOL45.../A...	900 [35.4]	2500 [98.4]	G1 1/2	74	80	94.5 [208]
KOL65.../A...				85	90	
KOL80.../A...	1000 [39.3]	3000 [118]	SAE 2	78	82	154 [339]
KOL120.../A...				88	92	

¹⁾ Dimension to the centre of the oblong hole

²⁾ According to DIN 45635

Unit dimensions: Type KOL45-120.../A... (nominal dimensions in mm [inch])

Vertical installation position ¹⁾



Connections on KOL80.../A... and KOL120.../A
SAE 2 3000 psi

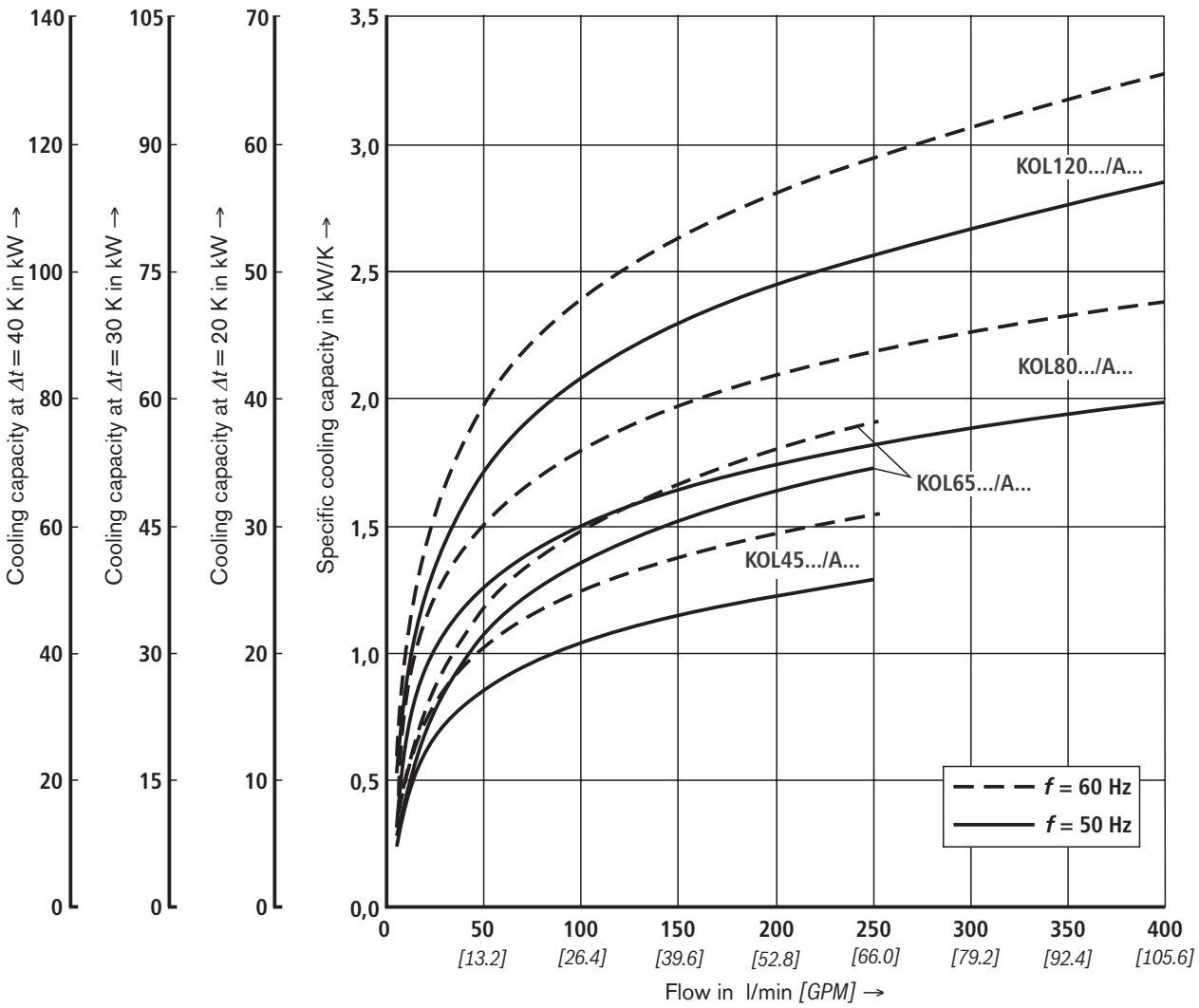
Cooler type	A	B	C	D	E	F	G	H	I	J	K	L
KOL45.../A...	32.5	16	840	573	85	235	385	535	685	835	81	791
KOL65.../A...	[1.27]	[0.62]	[33]	[22.5]	[3.34]	[9.25]	[15.1]	[21]	[26.9]	[32.8]	3.1	[31]
KOL80.../A...	36.0	21	1055	615	85	275	465	655	845	1035	98	998
KOL120.../A...	[1.41]	[0.82]	[41.5]	[24.2]	[3.34]	[10.8]	[18]	[25.7]	[33.2]	[40.7]	[3.85]	[39.2]

Cooler type	M	N	P	R	S	T	U	V	W	Sound pressure level in dB (A) ²⁾		Weight in kg [lbs]
										f = 50Hz	f = 60Hz	
KOL45.../A...	900	2500	872	50	G1 1/2	40	656	875	935	74	80	94.5 [208]
KOL65.../A...	[35.4]	[98.4]	[34.3]	[1.96]		[1.57]	[25.8]	[34.4]	[36.8]	85	90	
KOL80.../A...	1000	3000	1097	50	SAE 2	45	866	1100	1200	78	82	154 [339]
KOL120.../A...	[39.3]	[118]	[43]	[1.96]		[1.77]	[34]	[43.3]	[47.2]	88	92	

¹⁾ With ancillary equipment with air filter, the oil/air cooler cannot be placed on the cooler element!

²⁾ According to DIN 45635

Cooling capacity to DIN EN 1048: Type KOL45-120.../A...



Spare filter mat

Designation	For type	Material no.
FILTERMATTE 316X260MM FL220-G4 KOL 3/5	KOL 3/5	R901072973
FILTERMATTE 417X360MM FL220-G4 KOL 8/10	KOL 8/10	R901072926
FILTERMATTE 555X500MM FL220-G4 KOL 15/20	KOL 15/20	R901072979
FILTERMATTE 700X645MM FL220-G4 KOL 30/40	KOL 30/40	R901072981
FILTERMATTE 860X795MM FL220-G4 KOL 45/65	KOL 45/65	R901072983
FILTERMATTE 1075X1010MM FL220G4 KOL 80/120	KOL 80/120	R901072985

Spare filter elements ¹⁾

Designation	For type	Material no.
Filter element ABZFE-N0100-10-1X/M-DIN	KOL(P).../R-F100-10...	R901025362
Filter element ABZFE-N0100-03-1X/M-DIN	KOL(P).../R-F100-3...	R901025356
Filter element ABZFE-N0160-10-1X/M-DIN	KOL(P).../R-F160-10...	R901025363
Filter element ABZFE-N0160-03-1X/M-DIN	KOL(P).../R-F160-3...	R901025358

¹⁾ Filter element to DIN 24550

Electric motor

The electric motor is rated according to VDE 0530 part 1 (DIN EN 60034) for continuous operation S1 within the range of its nominal power. The electric motor complies with insulation class F and type of protection IP 55.

The electric motor must be connected so that the fan wheel rotates in the direction of the arrow. (Anti-clockwise direction of rotation).

It can be connected without any changes to power supplies having a frequency of 50Hz or 60Hz.

Technical data (for applications outside these parameters, please consult us!)

Supply voltage (other voltages on request)	U	V	230 / 400 - 50Hz; 265/460 - 60Hz \pm 5% Δ /Y
Frequency	f	Hz	50 / 60
Operating mode	S1 continuous operation		
Insulation class	F (winding)		
Type of protection to VDE 0530 / DIN EN 60034	IP 55		
Number of poles	4 / 6		

Frequency 50 Hz

Cooler type	Capacity kW	Speed min^{-1}	Power factor $\cos \varphi$	Nominal current at	
				Δ 230 V	Y 400 V
KOL3(8).../R...	0.25	940	0.80	1.30A	0.75 A
KOL5(10).../R...	0.37	1400	0.71	2.00 A	1.13 A
KOL15(30).../A...	0.37	940	0.67	2.00 A	1.20 A
KOL20(40).../A...	0.55	1390	0.69	2.60 A	1.50 A
KOL45.../A...	1.10	940	0.71	5.30 A	3.00 A
KOL65.../A...	1.50	1410	0.79	6.20 A	3.60 A
KOL80.../A...	1.50	940	0.70	7.10 A	4.10 A
KOL120.../A...	3.00	1425	0.81	11.50 A	6.60 A
KOLP3(8).../R...	1.10	910	0.75	5.40 A	3.10 A
KOLP5(10).../R...	1.50	1410	0.80	6.60 A	3.80 A

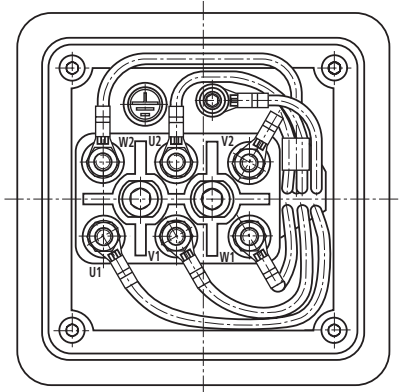
Frequency 60 Hz

Cooler type	Capacity kW	Speed min^{-1}	Power factor $\cos \varphi$	Nominal current at	
				Δ 230 V	Y 400 V
KOL3(8).../R...	0.30	1090	0.66	1.58	0.92
KOL5(10).../R...	0.44	1810	0.74	1.93	1.11
KOL15(30).../A...	0.44	1090	0.68	2.20	1.28
KOL20(40).../A...	0.66	1690	0.71	2.65	1.50
KOL45.../A...	1.30	1100	0.70	5.40	3.10
KOL65.../A...	1.80	1690	0.76	6.20	3.60
KOL80.../A...	1.80	1120	0.76	6.69	3.86
KOL120.../A...	3.60	1700	0.81	11.6	6.70
KOLP3(8).../R...	1.10	1080	0.79	5.00	2.90
KOLP5(10).../R...	1.50	1692	0.84	6.20	3.60

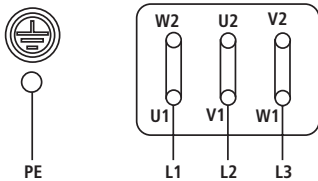
Terminal assignment

Terminal assignment in the terminal box on the oil/air cooler:

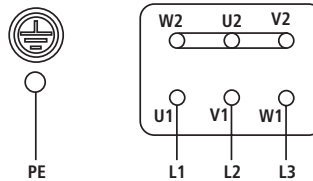
Factory setting:



Customer side: Δ triangle $U = 230\text{ V}$ at $f = 50\text{ Hz}$
 $U = 265\text{ V}$ at $f = 60\text{ Hz}$



Customer side: Y star $U = 400\text{ V}$ at $f = 50\text{ Hz}$
 $U = 460\text{ V}$ at $f = 60\text{ Hz}$



Electrical clogging indicators


Technical data for types KOL.../R-F100(F160)-...- E... and KOLP.../R-...F100 (F160)-...-E...


Electrical connection	Circular plug-in connection M12 x 1, 4-pin
Contact load, DC voltage	Max. 1 A
Voltage range	10 - 30 V DC
Max. switching power under ohmic load	20 VA; 20 W
Type of switching	Normally closed contact at 75% of the response pressure, normally open contact at 100% of the response pressure
Signal suppression	Signal switched through up to 30 °C [86 °F], switched back at 20 °C [68 °F]
Indication by LEDs in the electrical upper section	Ready for operation (LED green) 75% switching point (LED yellow) 100% switching point (LED red)
Type of protection to DIN EN 60529	IP 65

Temperature switch

With the help of the temperature switch, the oil/air cooler is switched on when the desired oil temperature is exceeded. The temperature switch has a firmly set switching point, which switches at a fluid temperature of 50°C [122°F] or 60°C [140°F] [140°F], respectively.

Electrical function

Temperature < 50 °C [122 °F] or 60 °C [140 °F] 

Temperaturer ≥ 50 °C [122 °F] or 60 °C [140 °F] 

The switching-back hysteresis is approx. 15 K

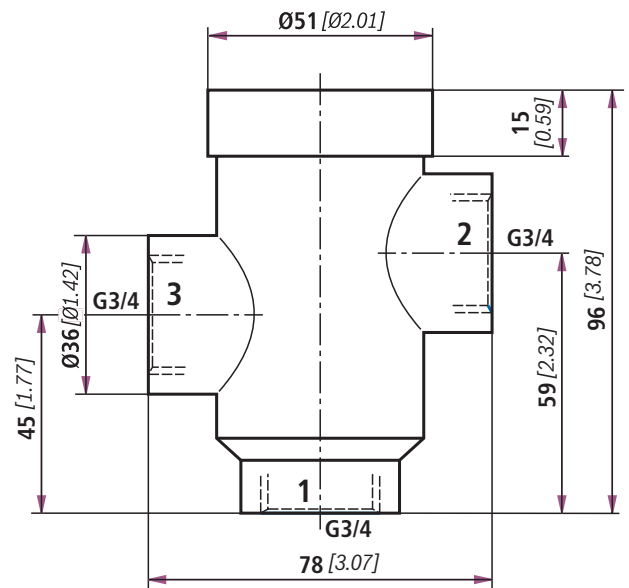
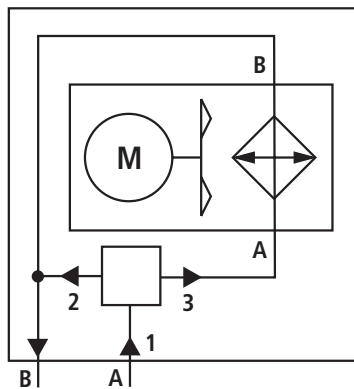
Technical cata

Maximum voltage	V	DC 30V, +10%/-15%	AC 230V, +10% /-15%
Maximum current	A	5	10
Type of protection	IP 65		
Type of contact	Normally closed		

By-pass (temperatur-controlled)

When the desired fluid temperature is exceeded, the by-pass starts to open the line to the oil/air cooler. The fluid now flows through the oil/air cooler and is cooled. When the fluid temperature falls below the desired value, the by-pass closes the line to the oil/air cooler. Depending on the version, the firmly set start of opening is 55°C [131 °F] or 65°C [149 °F].

By-pass control in the cooling circuit



Calculation example / cooler selection

a) Cooling capacity calculation through temperature measurement

By measuring the temperature increase in the tank within a sufficiently large time interval, the required cooling capacity can be calculated as follows:

Technical data to be measured:

- ϑ_1 = Hydraulic fluid temperature in °C at the beginning of the measurement
- ϑ_2 = Hydraulic fluid temperature in °C at the end of the measurement
- ϑ_u = Ambient air temperature in °C
- t = Time interval in min

In addition, the following details are required:

- V = Tank capacity in L
- ρ = Density of the hydraulic fluid in kg/L
(for mineral oil $\rho = 0.915$ kg/L)
- c = Specific thermal capacity in $\frac{\text{kJ}}{\text{kg K}}$
(for mineral oil $c = 1.88 \frac{\text{kJ}}{\text{kg K}}$)

The power loss incurring in the form of heat is calculated as follows:

P_V = Power loss in kW

$$P_V = \frac{V \cdot \rho \cdot c \cdot (\vartheta_2 - \vartheta_1)}{t \cdot 60} \text{ in kW}$$

Example: $V = 230$ L; $\vartheta_1 = 25$ °C; $\vartheta_2 = 66$ °C; $t = 90$ min

$$P_V = \frac{230 \text{ L} \cdot 0.915 \frac{\text{kg}}{\text{L}} \cdot 1.88 \frac{\text{kJ}}{\text{kg K}} \cdot (66 \text{ °C} - 25 \text{ °C})}{90 \text{ min} \cdot 60 \text{ s/min}} = 3.0 \text{ kW}$$

The calculated power loss can be used to calculate the specific cooling capacity that is required for the selection of the cooler:

P_{01} = Specific cooling capacity in kW/K

ϑ_{BT} = Optimum operating temperature of the hydraulic fluid in °C

Example: $P_V = 3.0$ kW; $\vartheta_{BT} = 50$ °C; $\vartheta_u = 25$ °C

$$P_{01} = \frac{P_V}{\vartheta_{BT} - \vartheta_u} = \frac{3.0 \text{ kW}}{50 \text{ °C} - 25 \text{ °C}} = 0.12 \frac{\text{kW}}{\text{K}}$$

On the basis of the flow to be considered (e.g. 40 L/min) a suitable cooler can be selected from the diagram (page 8). The data of our example lead to the selection of type KOL5.../R... .

b) Cooling capacity calculation through approximation calculation

An approximated value for the power loss can be calculated as follows:

P_M = Drive power of the motor in kW

P_V = Power loss in kW

η = Efficiency of the pump ($\eta = 0.7$ to 0.8)

$$P_V = P_M \cdot (1 - \eta) \text{ in kW}$$

Example:

$$P_M = 10.0 \text{ kW}; \eta = 0.7$$

$$P_V = 10.0 \text{ kW} \cdot (1 - 0.7)$$

$$P_V = 3.0 \text{ kW}$$

The calculated power loss can be used to calculate the specific cooling capacity that is required for the selection of the cooler.

P_{01} = Specific cooling capacity in kW/K

ϑ_{BT} = Optimum operating temperature of the hydraulic fluid in °C

Example: $P_V = 3.0$ kW; $\vartheta_{BT} = 50$ °C; $\vartheta_u = 25$ °C

$$P_{01} = \frac{P_V}{\vartheta_{BT} - \vartheta_u} = \frac{3.0 \text{ kW}}{50 \text{ °C} - 25 \text{ °C}}$$

$$P_{01} = 0.12 \frac{\text{kW}}{\text{K}}$$

On the basis of the flow to be considered (e.g. 40 l/min) a suitable cooler (page 8) can be selected from the diagram. The data of our example lead to the selection of type KOL5.../R... .

Altitude correction factor

The cooling capacity of the oil/air cooler reduces at increasing altitudes due to the reduction in the air density. This can be compensated for with the correction factors given in the following.

Example: Installation height 1000 m above sea level:

$$P_{01(1000 \text{ m})} = P_{01} \cdot 0.95$$

Altitude above sea level in m	Correction factor
0	1.00
500	~ 0.98
1000	~ 0.95
2000	~ 0.91
3000	~ 0.86
4000	~ 0.82

Installation notes

- Check that the oil/air cooler has been properly connected (hydraulically and electrically) to the machine to be operated.
- For the electrical connections of the electric motor, use the washers and connecting bridges that are included in the scope of supply.
- Check the direction of rotation of the fan wheel (anti-clockwise) by briefly switching on the electric motor (see also direction of rotation arrow on the housing).
- The electric motor must be protected by a feature incorporating an overload relay. This must be set to the nominal current indicated on the nameplate / performance plate.
- When installing the oil/air cooler with external gear pump (type KOLP.../R... and KOLP.../R-...F...), take particular care of the motor's direction of rotation, see direction of rotation arrow.
- In no case may the pump of the oil/air cooler (type KOLP.../R... and KOLP.../R-...F...) be run without hydraulic fluid. Moreover, ensure sufficient lubrication of the pump.
- To achieve the optimum cooling capacity, the oil/air cooler must be bled before commissioning. In addition, care should be taken that the units operate bubble-free.
- The oil/air cooler may only be used within the permissible data limits. Moreover, it may only be operated when it is in a flawless condition.
- When carrying out any work on the oil/air cooler, depressurise the system and disconnect it from the power supply. In addition, see to it that the fan wheel does no longer rotate.
- Unauthorised conversions or changes that affect safety and functions are not permitted.
- Never remove any existing protective features or guards.
- Keep the oil/air cooler clean and do not cover it; change clogged filter mats, because otherwise the hydraulic fluid will overheat.
- Strictly observe general safety and accident prevention regulations.

Note relating to EC Machinery Directive 98/37/EC, Annex II, Section B:

The assemblies are manufactured to comply with the harmonised standards EN 982, EN 983, DIN EN ISO 12100 and DIN EN 60204-1.

Commissioning is prohibited until it was established that the machine, into which the assembly is to be integrated, conforms with the stipulations of the EC Directive.

Attention!

The oil/air cooler can heat up during operation
→ **risk of injury!**

Only authorised, trained and instructed personnel are allowed to make settings and carry out maintenance and servicing on the oil/air cooler.

Use only genuine Bosch Rexroth spare parts for repairs!

Caution!

If Bosch Rexroth hydraulic products are installed in the vicinity of sources of ignition or strong heat radiators, a shield must be provided in order that the hydraulic fluid cannot ignite in the case of spillage and hoses are protected against premature aging. Hydraulic oil based on mineral oil is water-endangering and inflammable. It may only be used, if the corresponding safety data sheet of the manufacturer is available and all

precautions described therein were taken. If leakage of the hydraulic product can lead to water or ground contamination, the hydraulic product must be placed in a suitable collection tank. In Germany, hydraulic systems are classified as "systems for handling water-endangering substances in the sense of the Water Resources Act (WHG)." In this context, please observe in particular §1 and §19 WHG (§19g, §19i, §19l).