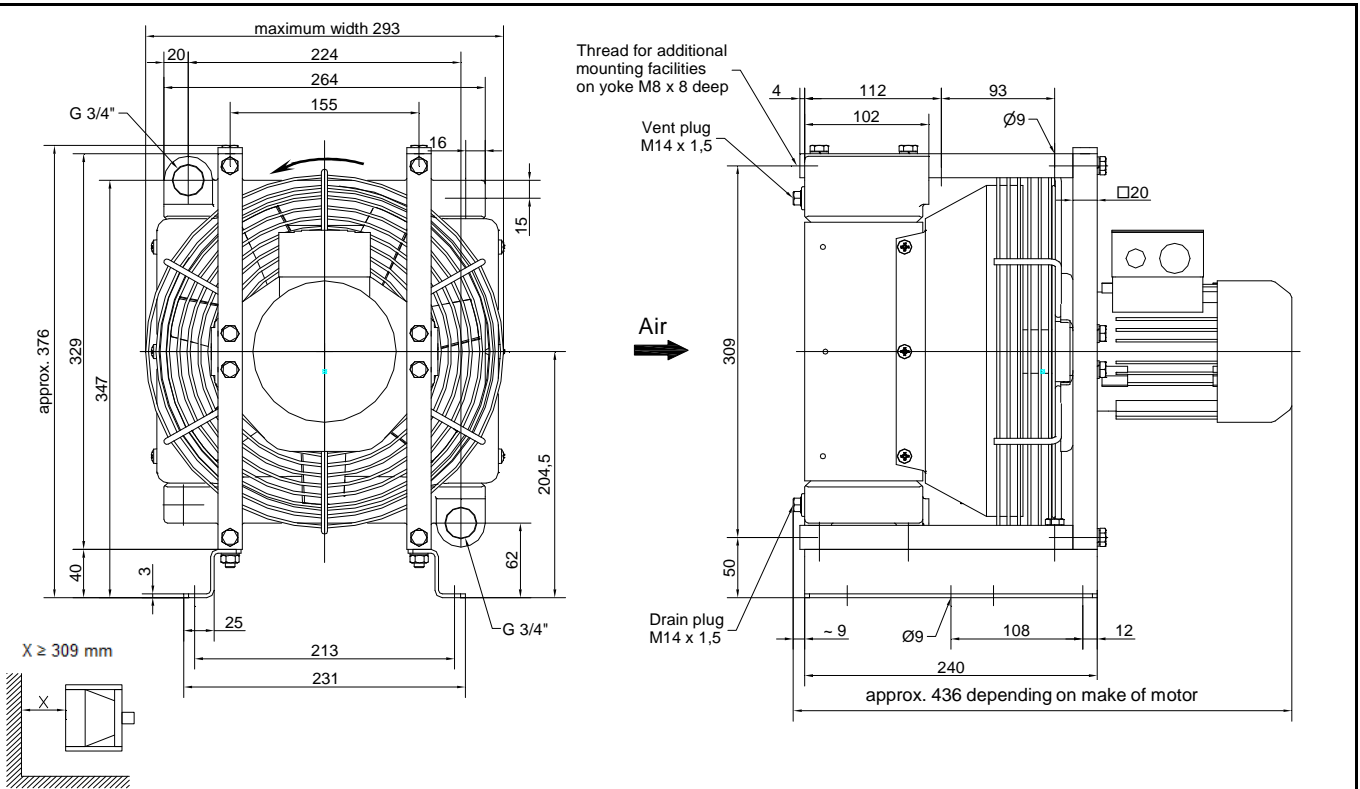


OKAN 2.79 Size 02 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7902.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\triangleq 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air			
Technical data	Type:	2.7902.2.□□ -	81.□□	51.□□
	Face area	m ²	0,05	0,05
	Fan speed	1/min	3000	1500
	Fan load	kW	0,11	0,01
	Air flow	kg/s	0,34	0,17
	Motor power	kW	0,25 [IE1]	0,18 [IE1]
	Motor class	230VD / 400VY 50Hz 460VY 60 Hz		
	Motor frame size / type / flange	63 / IM B14 / C90		
	degree of protection / insulation (motor)	IP 55 / F(155) - B(130)		
	Total weight with motor	kg	16,1	16,1
	Weight without motor	kg	12	12
	Oil content	l	1,6	1,6
	Noise level 1m/7m *	db(A)	79 / 67	61 / 49
Standard-Cooler	Type:	2.7902.2.11-81.00.00	2.7902.2.11-51.00.00	
	ZNo.	210 002 053 0	210 002 168 0	
Max. working pressure	16 bar			
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **	
Material	Cooler: Aluminium	Fan shroud: Plastic		
	Fan: Plastic	Other parts: Steel (zinc plated)		
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.			
Hint	* May vary by ± 4 db due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.			

Issue: 01.2017

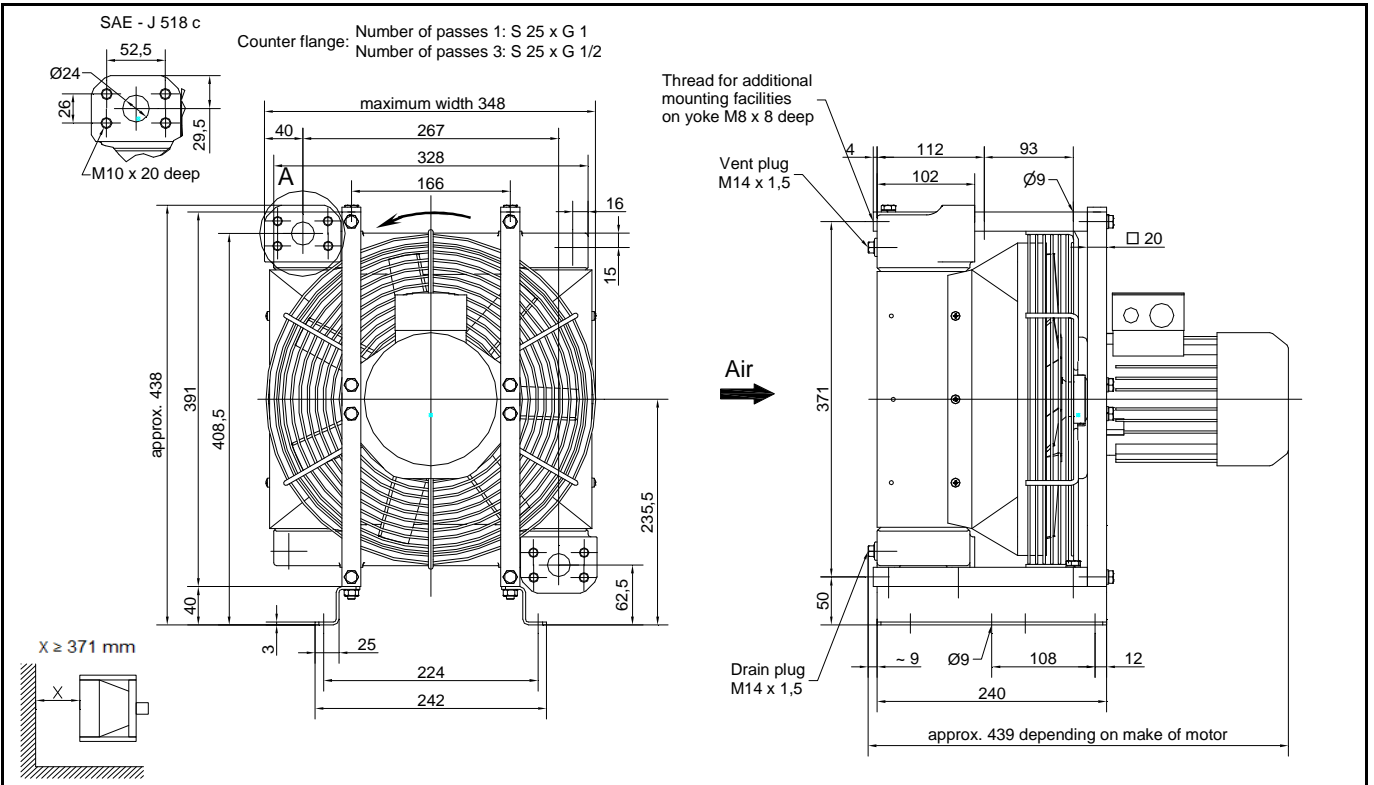
<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 3,3 \text{ kW}$; $V_{\dot{O}i} = 10 \text{ l/min}$; $t_{\dot{O}iE} = 60 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 60 - 30 = 30 \text{ K}$ $P_{01} = \frac{3,3 \text{ kW}}{30 \text{ K}} = 0,11 \text{ kW/K}$</p> <p>Select: 2.7902.2.31 - 81.□□ (see performance diagram) $P_{01} = 0,126 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 30 \text{ K} \cdot 0,126 \text{ kW/K} = 3,8 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 3,8}{10} = 13,6 \text{ K}$; $\Delta t_L = \frac{3,8}{0,34} = 11,1 \text{ K}$</p>																																
<p>Performance diagram</p>																																	
<p>Pressure loss diagram</p>																																	
<p>Δp_{Oi} - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\triangleq 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																		

OKAN 2.79 Size 03 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7903.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\approx 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7903.2.□□ -	81.□□	51.□□	31.□□
	Face area	m ²	0,08	0,08	0,08
	Fan speed	1/min	3000	1500	1000
	Fan load	kW	0,24	0,04	0,01
	Air flow	kg/s	0,62	0,3	0,19
	Motor power	kW	0,55 [IE1]	0,37 [IE1]	0,25 [IE1]
	Motor class	230VD / 400VY 50Hz 460VY 60 Hz			
	Motor frame size / type / flange	71 / IM B14 / C105			
	degree of protection / insulation (motor)	IP 55 / F(155) - B(130)			
	Total weight with motor	kg	22,6	22	22,3
	Weight without motor	kg	16	16	16
	Oil content	l	2,7	2,7	2,7
	Noise level 1m/7m *	db(A)	84 / 72	70 / 58	59 / 47
	Standard-Cooler	Type:	2.7903.2.11-81.00.00	2.7903.2.11-51.00.00	2.7903.2.11-31.00.00
	ZNo.	210 001 991 0	210 002 026 0	210 002 316 0	
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium	Fan shroud: Plastic	Other parts: Steel (zinc plated)		
	Fan: Plastic				
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by $\pm 4 \text{ db}$ due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

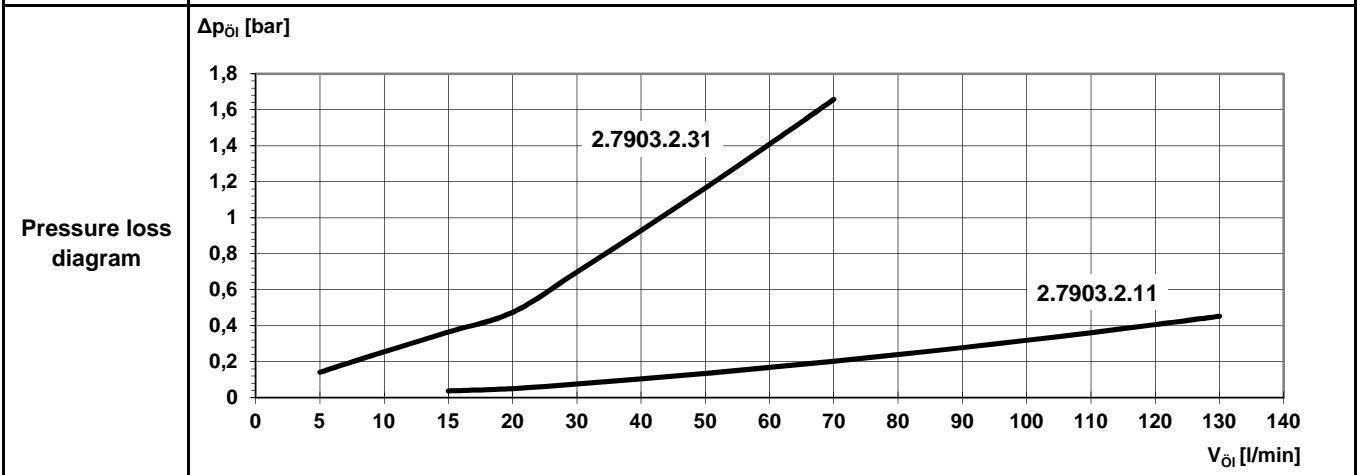
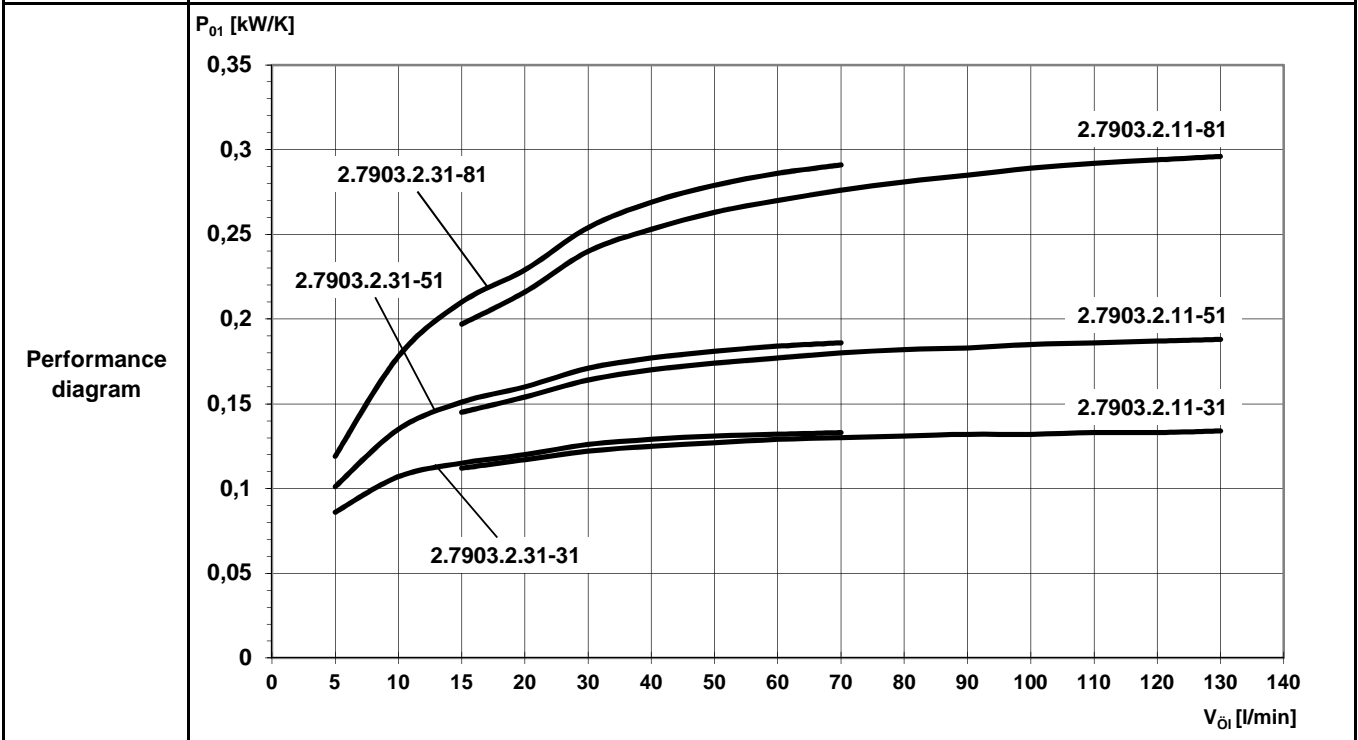
Issue: 01.2017

Introduction	1. Following data are known:	2. From the following can be calculated:
	Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s]	Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K] 3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]

In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.

Example	Given: $P_V = 6 \text{ kW}$; $V_{\dot{O}i} = 30 \text{ l/min}$; $t_{\dot{O}iE} = 60 \text{ °C}$; $t_{LE} = 30 \text{ °C}$
	Calculated: $ETD = 60 - 30 = 30 \text{ K}$ $P_{01} = \frac{6 \text{ kW}}{30 \text{ K}} = 0,2 \text{ kW/K}$
	Select: 2.7903.2.11 - 81.□□ (see performance diagram) $P_{01} = 0,24 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 30 \text{ K} \cdot 0,24 \text{ kW/K} = 7,2 \text{ kW}$

Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 7,2}{30} = 8,6 \text{ K}$; $\Delta t_L = \frac{7,2}{0,62} = 11,6 \text{ K}$



Δp_{Oi} - Correction

The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\approx 32 \text{ cSt}$).
 For differing viscosities, the Δp -value has to be multiplied by the factor f.

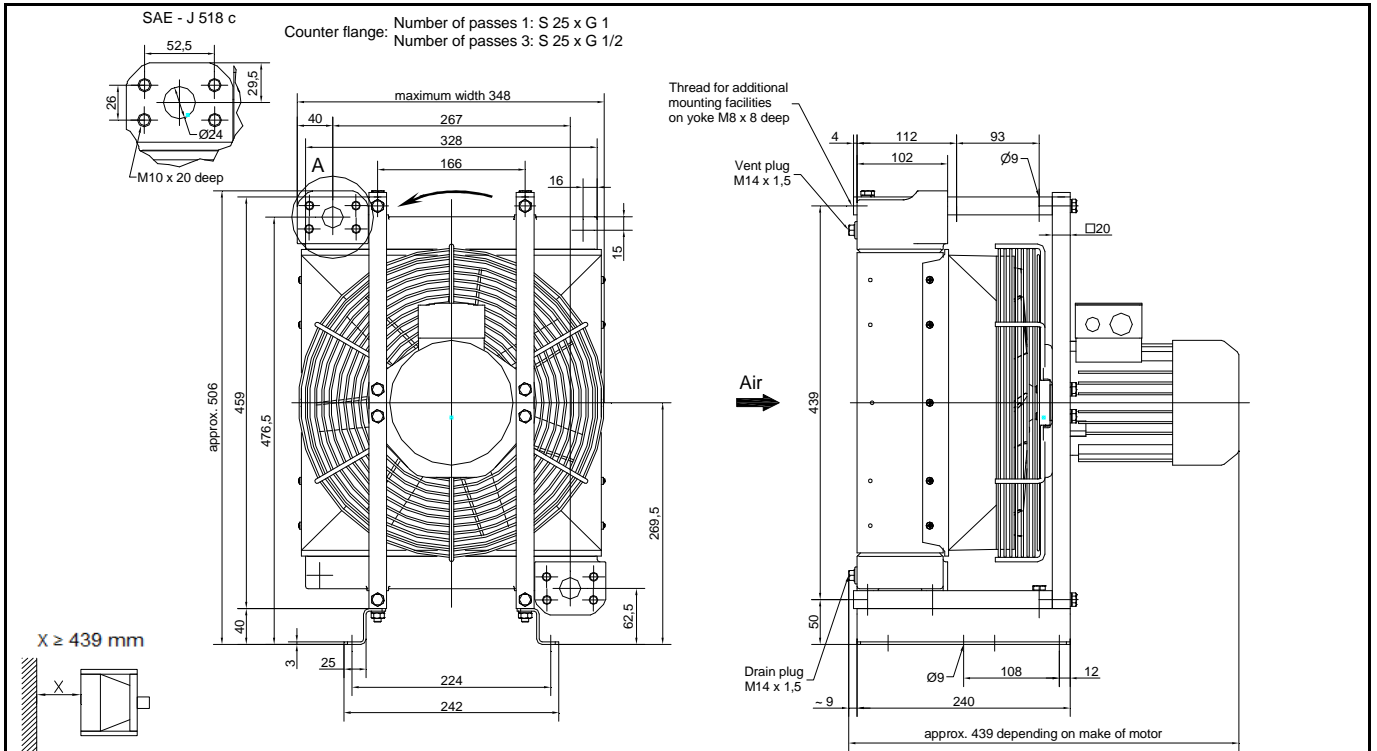
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f

OKAN 2.79 Size 04 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7904.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\approx 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7904.2.□□ -	81.□□	51.□□	31.□□
	Face area	m ²	0,1	0,1	0,1
	Fan speed	1/min	3000	1500	1000
	Fan load	kW	0,24	0,04	0,01
	Air flow	kg/s	0,62	0,3	0,19
	Motor power	kW	0,55 [IE1]	0,37 [IE1]	0,25 [IE1]
	Motor class	230VD / 400VY 50Hz 460VY 60 Hz			
	Motor frame size / type / flange	71 / IM B14 / C105			
	degree of protection / insulation (motor)	IP 55 / F(155) - B(130)			
	Total weight with motor	kg	24,6	24	24,3
	Weight without motor	kg	18	18	18
	Oil content	l	3	3	3
	Noise level 1m/7m *	db(A)	84 / 72	70 / 58	59 / 47
	Standard-Cooler	Type: ZNo.	2.7904.2.11-81.00.00 210 001 995 0	2.7904.2.11-51.00.00 210 002 742 0	2.7904.2.11-31.00.00 210 002 741 0
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium Fan: Plastic	Fan shroud: Plastic Other parts: Steel (zinc plated)			
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by $\pm 4 \text{ db}$ due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 9 \text{ kW}$; $V_{\dot{O}i} = 150 \text{ l/min}$; $t_{\dot{O}iE} = 60 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 60 - 30 = 30 \text{ K}$ $P_{01} = \frac{9 \text{ kW}}{30 \text{ K}} = 0,3 \text{ kW/K}$</p> <p>Select: 2.7904.2.11 - 81.□□ (see performance diagram) $P_{01} = 0,33 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 30 \text{ K} \cdot 0,33 \text{ kW/K} = 9,9 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 9,9}{150} = 2,4 \text{ K}$; $\Delta t_L = \frac{9,9}{0,62} = 16 \text{ K}$</p>																																
<p>Performance diagram</p>	<p>The graph plots specific cooling capacity P_{01} [kW/K] on the y-axis (0 to 0.4) against oil flow $V_{\dot{O}i}$ [l/min] on the x-axis (0 to 300). Four curves are shown: 2.7904.2.31-81 (top), 2.7904.2.31-51, 2.7904.2.11-51, and 2.7904.2.11-31 (bottom). All curves show an increasing trend of P_{01} with $V_{\dot{O}i}$.</p>																																
<p>Pressure loss diagram</p>	<p>The graph plots pressure loss $\Delta p_{\dot{O}i}$ [bar] on the y-axis (0 to 2) against oil flow $V_{\dot{O}i}$ [l/min] on the x-axis (0 to 300). Two curves are shown: 2.7904.2.31 (top) and 2.7904.2.11 (bottom). Both curves show an exponential increase in pressure loss with increasing oil flow.</p>																																
<p>$\Delta p_{\dot{O}i}$ - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\approx 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																		

<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 21 \text{ kW}$; $V_{\dot{O}i} = 60 \text{ l/min}$; $t_{\dot{O}iE} = 90 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 90 - 30 = 60 \text{ K}$ $P_{01} = \frac{21 \text{ kW}}{60 \text{ K}} = 0,35 \text{ kW/K}$</p> <p>Select: 2.7905.2.11 - 51.□□ (see performance diagram) $P_{01} = 0,38 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 60 \text{ K} \cdot 0,38 \text{ kW/K} = 22,8 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 22,8}{60} = 13,7 \text{ K}$; $\Delta t_L = \frac{22,8}{0,74} = 30,8 \text{ K}$</p>																																
<p>Performance diagram</p>	<p>The graph plots specific cooling capacity P_{01} [kW/K] on the y-axis (0 to 0.5) against oil flow $V_{\dot{O}i}$ [l/min] on the x-axis (0 to 350). Six curves are shown, representing different models. The curves generally show an increase in P_{01} with increasing $V_{\dot{O}i}$. The models are: 2.7905.2.11-51 (highest), 2.7905.2.31-51, 2.7905.2.11-31, 2.7905.2.31-31, 2.7905.2.11-11, and 2.7905.2.31-11 (lowest).</p>																																
<p>Pressure loss diagram</p>	<p>The graph plots pressure loss $\Delta p_{\dot{O}i}$ [bar] on the y-axis (0 to 2) against oil flow $V_{\dot{O}i}$ [l/min] on the x-axis (0 to 350). Two curves are shown: 2.7905.2.31 (higher pressure loss) and 2.7905.2.11 (lower pressure loss). Both curves show an increase in pressure loss with increasing oil flow.</p>																																
<p>$\Delta p_{\dot{O}i}$ - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\approx 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
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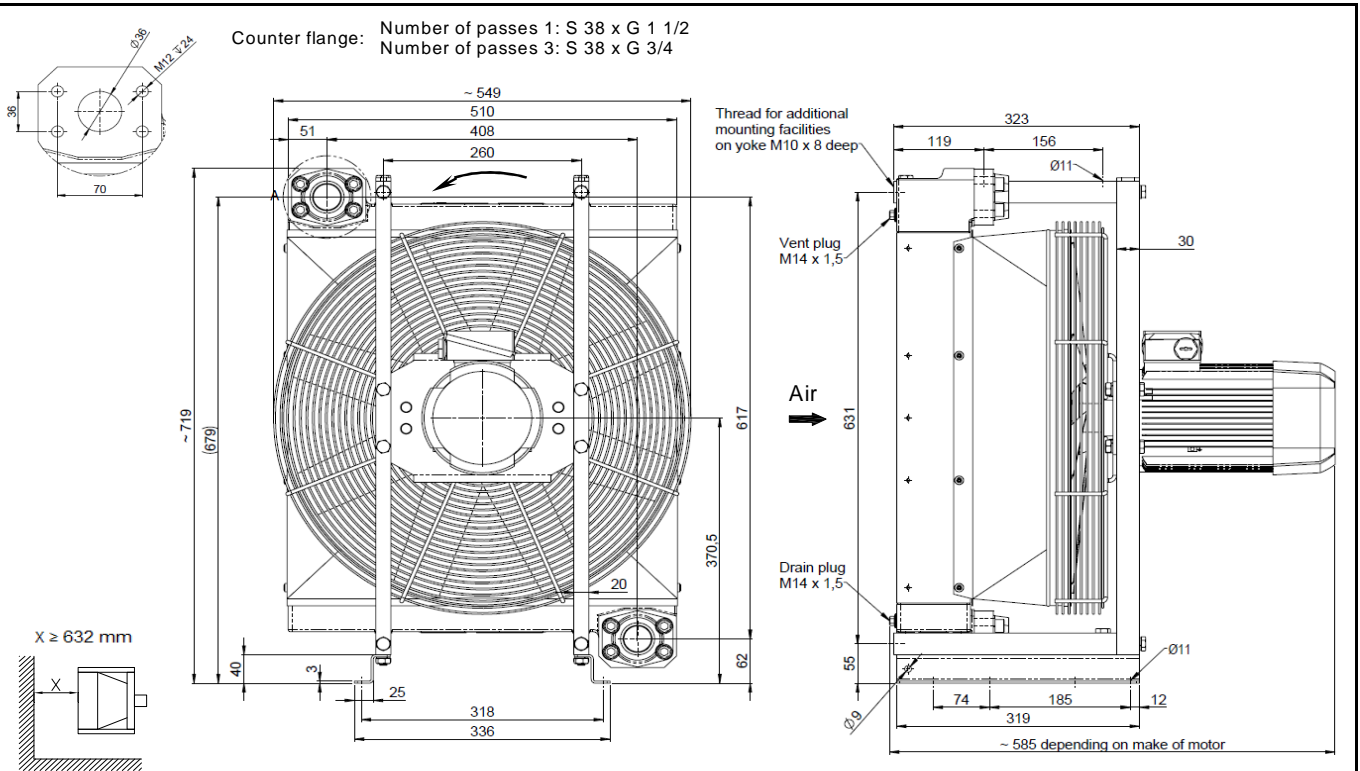
<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 15 \text{ kW}$; $V_{\dot{O}i} = 80 \text{ l/min}$; $t_{\dot{O}iE} = 75 \text{ °C}$; $t_{LE} = 35 \text{ °C}$</p> <p>Calculated: $ETD = 75 - 35 = 40 \text{ K}$ $P_{01} = \frac{15 \text{ kW}}{40 \text{ K}} = 0,375 \text{ kW/K}$</p> <p>Select: 2.7906.2.11 - 51.□□ (see performance diagram) $P_{01} = 0,425 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 40 \text{ K} \cdot 0,425 \text{ kW/K} = 17 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 17}{80} = 7,7 \text{ K}$; $\Delta t_L = \frac{17}{0,74} = 23 \text{ K}$</p>																																
<p>Performance diagram</p>	<p>The performance diagram plots specific cooling capacity P_{01} [kW/K] on the y-axis (0 to 0.5) against oil flow $V_{\dot{O}i}$ [l/min] on the x-axis (0 to 350). Four curves are shown, representing different models: 2.7906.2.11-51 (highest capacity), 2.7906.2.31-51, 2.7906.2.11-31, and 2.7906.2.31-11 (lowest capacity).</p>																																
<p>Pressure loss diagram</p>	<p>The pressure loss diagram plots pressure drop $\Delta p_{\dot{O}i}$ [bar] on the y-axis (0 to 2.5) against oil flow $V_{\dot{O}i}$ [l/min] on the x-axis (0 to 350). Two curves are shown: 2.7906.2.31 (higher pressure drop) and 2.7906.2.11 (lower pressure drop).</p>																																
<p>$\Delta p_{\dot{O}i}$ - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\triangleq 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																		

OKAN 2.79 Size 07 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7907.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

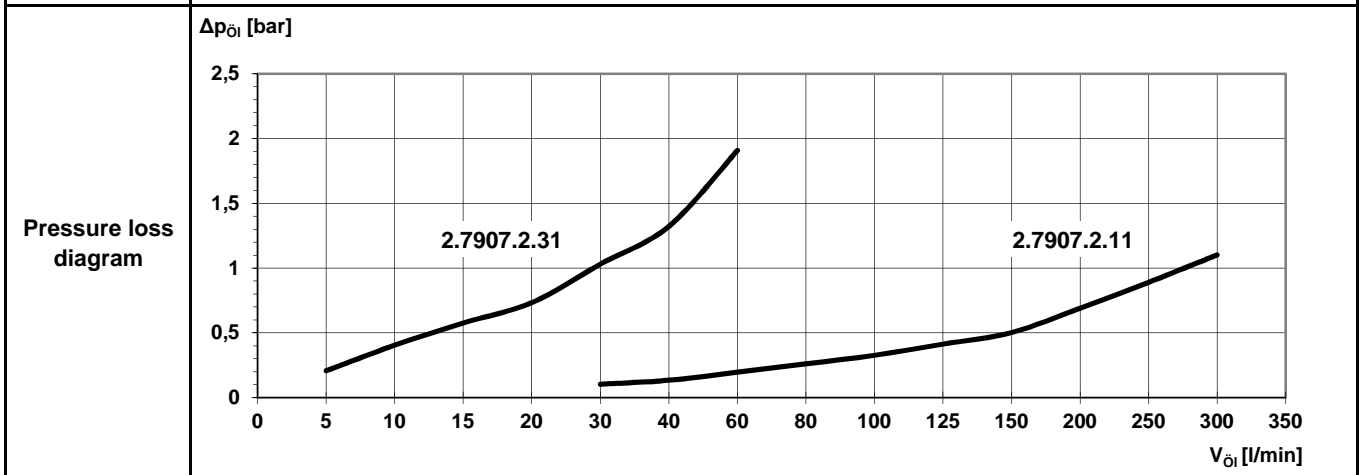
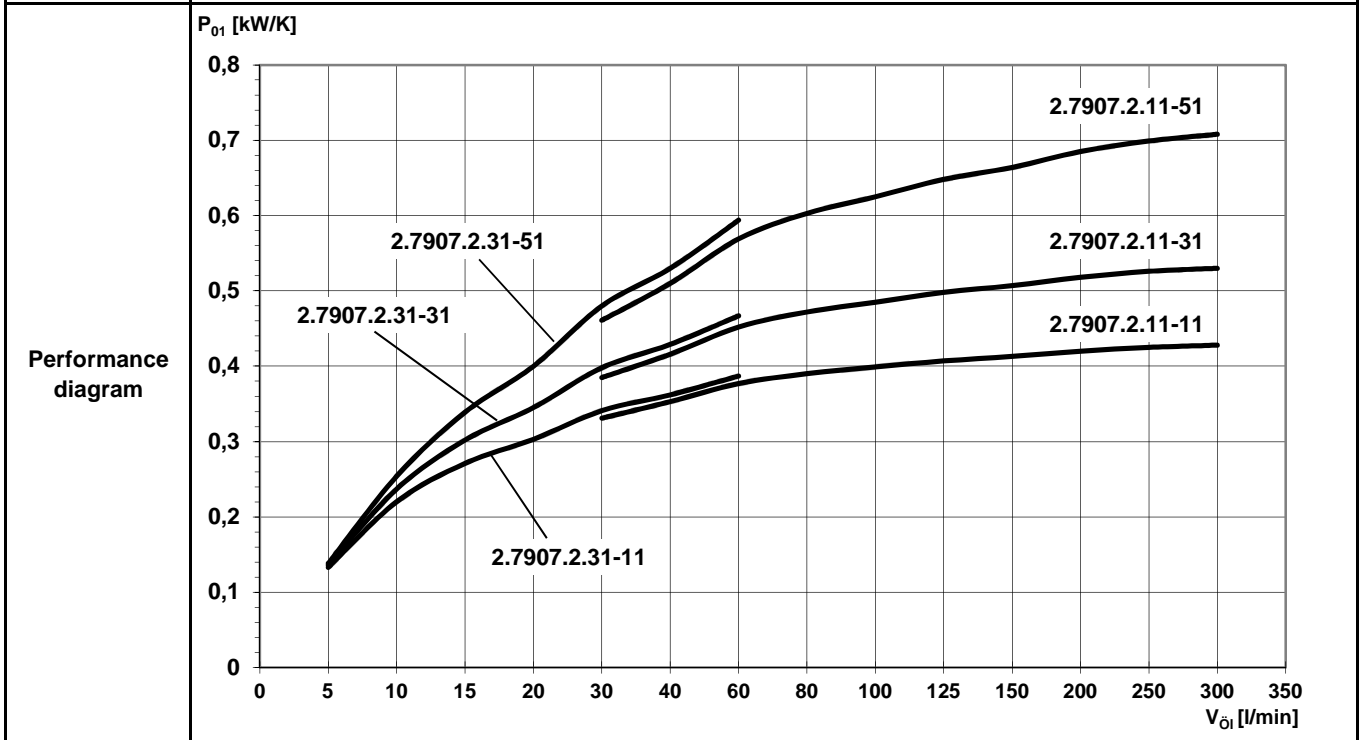
Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\approx 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7907.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	0,25	0,25	0,25
	Fan speed	1/min	1500	1000	750
	Fan load	kW	0,27	0,07	0,03
	Air flow	kg/s	1,2	0,8	0,6
	Motor power	kW	0,75 [IE3]	0,55 [IE1]	0,25 [IE1]
	Motor class	230VD / 400VY 50Hz 460VY 60 Hz			
	Motor frame size / type / flange	80 / IM B14 / C120			
	degree of protection / insulation (motor)	IP 55 / F(155) - B(130)			
	Total weight with motor	kg	51	47	47
	Weight without motor	kg	37	37	37
	Oil content	l	6,2	6,2	6,2
	Noise level 1m/7m *	db(A)	82 / 70	70 / 58	62 / 50
	Standard-Cooler	Type: ZNo.	2.7907.2.11-51.00.00 210 002 001 0	2.7907.2.11-31.00.00 210 002 002 0	2.7907.2.11-11.00.00 210 002 595 0
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium Fan: Plastic	Fan shroud: Steel (zinc plated) Other parts: Steel (zinc plated)			
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by ± 4 db due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

Introduction	1. Following data are known:	2. From the following can be calculated:
	Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.	Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K] 3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]

Example	<p>Given: $P_V = 18 \text{ kW}$; $V_{\dot{O}i} = 100 \text{ l/min}$; $t_{\dot{O}iE} = 80 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 80 - 30 = 50 \text{ K}$</p> <p>$P_{01} = \frac{18 \text{ kW}}{50 \text{ K}} = 0,36 \text{ kW/K}$</p> <p>Select: 2.7907.2.11 - 11.□□ (see performance diagram) $P_{01} = 0,4 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 50 \text{ K} \cdot 0,4 \text{ kW/K} = 20 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 20}{100} = 7,2 \text{ K}$; $\Delta t_L = \frac{20}{0,6} = 33,3 \text{ K}$</p>
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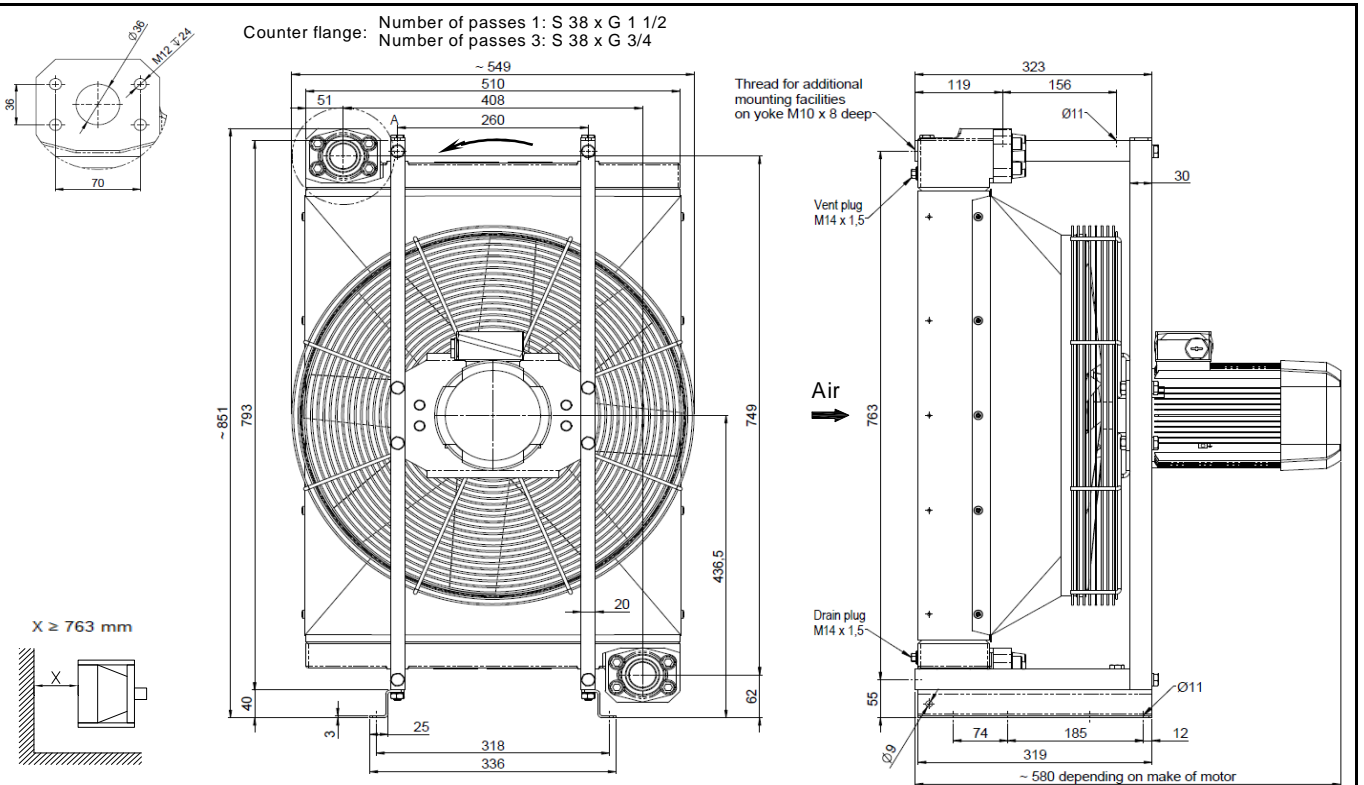
Δp_{Oi} - Correction	The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\approx 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f .															
	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s
	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f

OKAN 2.79 Size 08 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7908.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area! Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\approx 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7908.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	0,315	0,315	0,315
	Fan speed	1/min	1500	1000	750
	Fan load	kW	0,27	0,07	0,03
	Air flow	kg/s	1,2	0,8	0,6
	Motor power	kW	0,75 [IE3]	0,55 [IE1]	0,25 [IE1]
	Motor class	230VD / 400VY 50Hz 460VY 60 Hz			
	Motor frame size / type / flange	80 / IM B14 / C120			
	degree of protection / insulation (motor)	IP 55 / F(155) - B(130)			
	Total weight with motor	kg	56	52	52
	Weight without motor	kg	42	42	42
	Oil content	l	7	7	7
	Noise level 1m/7m *	db(A)	81 / 69	72 / 60	66 / 54
Standard-Cooler	Type:	2.7908.2.11-51.00.00	2.7908.2.11-31.00.00	2.7908.2.11-11.00.00	
	ZNo.	210 001 945 0	210 002 331 0	210 002 709 0	
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium	Fan shroud: Steel (zinc plated)			
	Fan: Plastic	Other parts: Steel (zinc plated)			
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by $\pm 4 \text{ db}$ due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

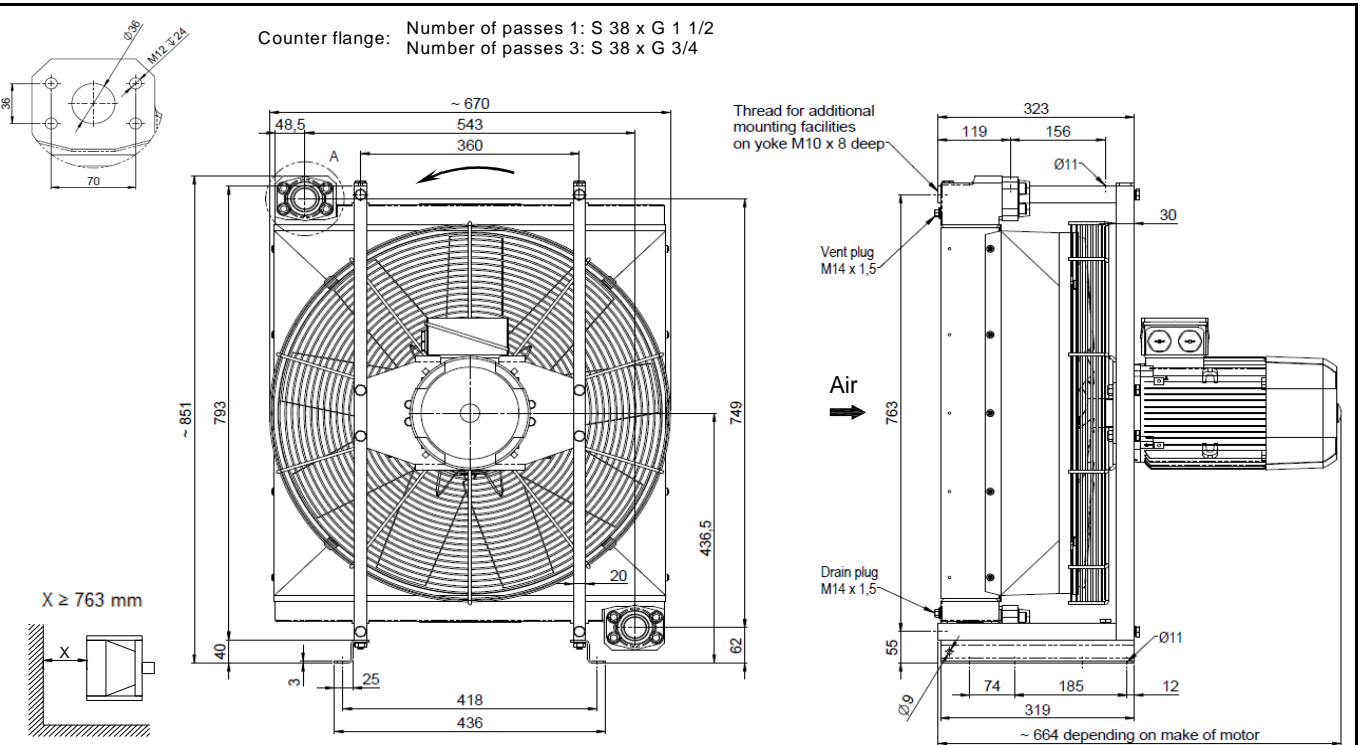
Introduction	<p>1. Following data are known:</p> <p>Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s]</p> <p>In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p>	<p>2. From the following can be calculated:</p> <p>Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated:</p> <p>Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
	<p>Example</p> <p>Given: $P_V = 25 \text{ kW}$; $V_{\dot{O}i} = 150 \text{ l/min}$; $t_{\dot{O}iE} = 80 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 80 - 30 = 50 \text{ K}$</p> <p>$P_{01} = \frac{25 \text{ kW}}{50 \text{ K}} = 0,5 \text{ kW/K}$</p> <p>Select: 2.7908.2.11 - 31.□□ (see performance diagram) $P_{01} = 0,54 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 50 \text{ K} \cdot 0,54 \text{ kW/K} = 27 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 27}{150} = 6,5 \text{ K}$; $\Delta t_L = \frac{27}{0,8} = 33,8 \text{ K}$</p>																																	
Performance diagram																																		
Pressure loss diagram																																		
Δp_Oi - Correction	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\triangleq 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>		10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																			
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																			

OKAN 2.79 Size 09 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7909.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\approx 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7909.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	0,4	0,4	0,4
	Fan speed	1/min	1500	1000	750
	Fan load	kW	1,61	0,44	0,15
	Air flow	kg/s	3,0	1,9	1,4
	Motor power	kW	3,0 [IE3]	1,1 [IE3]	0,55 [IE1]
	Motor class		400VD / 690VY 50Hz 460VD 60 Hz	230VD / 400VY 50Hz 460VY 60 Hz	
	Motor frame size / type / flange		100L / IM B14 / C160	90L / IM B14 / C140	
	degree of protection / insulation (motor)		IP 55 / F(155) - B(130)		
	Total weight with motor	kg	82	71	65
	Weight without motor	kg	52	52	52
	Oil content	l	8,8	8,8	8,8
	Noise level 1m/7m *	db(A)	90 / 78	80 / 68	75 / 63
Standard-Cooler	Type: ZNo.	2.7909.2.11-51.01.00 210 002 734 0	2.7909.2.11-31.00.00 210 001 952 0	2.7909.2.11-11.00.00 210 001 929 0	
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium Fan: Plastic	Fan shroud: Other parts:	Steel (zinc plated) Steel (zinc plated)		
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by $\pm 4 \text{ db}$ due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

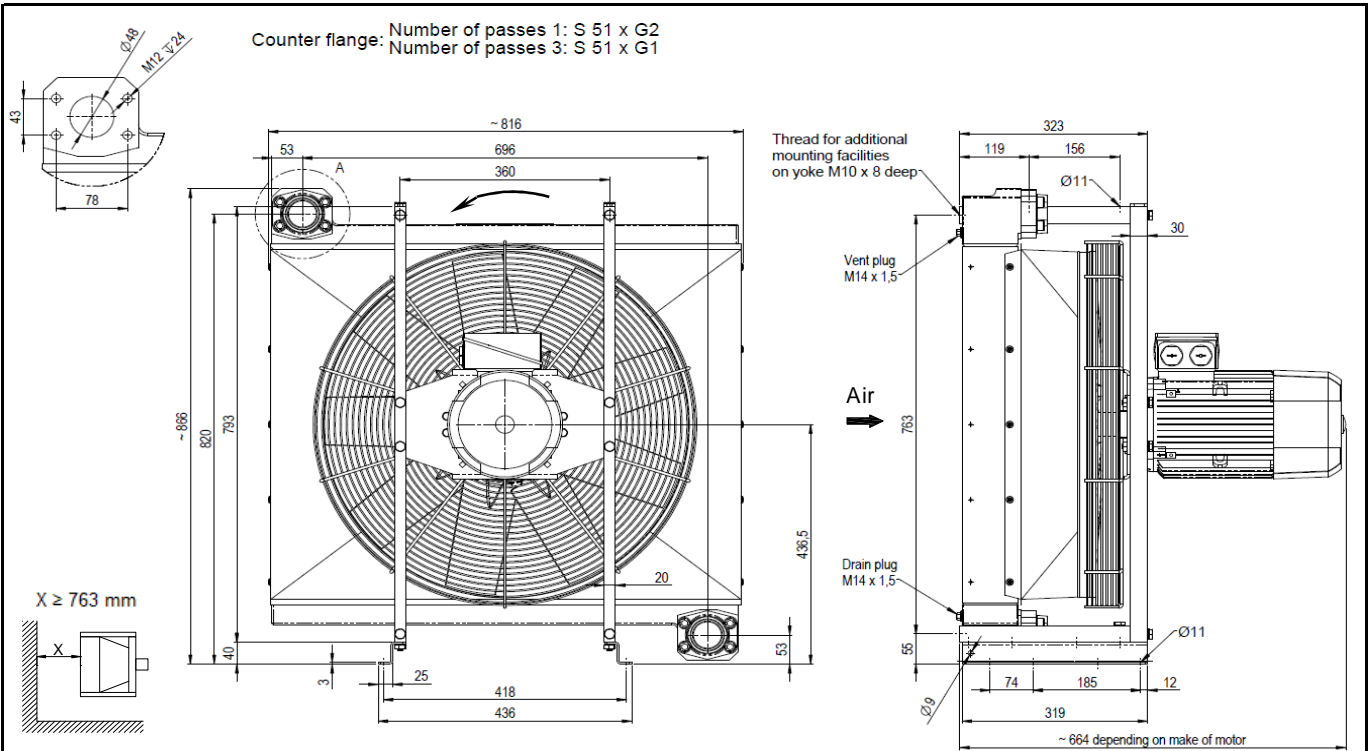
<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 43 \text{ kW}$; $V_{\dot{O}i} = 125 \text{ l/min}$; $t_{\dot{O}iE} = 80 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 80 - 30 = 50 \text{ K}$ $P_{01} = \frac{43 \text{ kW}}{50 \text{ K}} = 0,86 \text{ kW/K}$</p> <p>Select: 2.7909.2.11 - 31.□□ (see performance diagram) $P_{01} = 0,96 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 50 \text{ K} \cdot 0,96 \text{ kW/K} = 48 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 48}{125} = 13,8 \text{ K}$; $\Delta t_L = \frac{48}{1,9} = 25,3 \text{ K}$</p>																																
<p>Performance diagram</p>																																	
<p>Pressure loss diagram</p>																																	
<p>Δp_{Oi} - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\triangleq 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																		

OKAN 2.79 Size 10 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7910.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

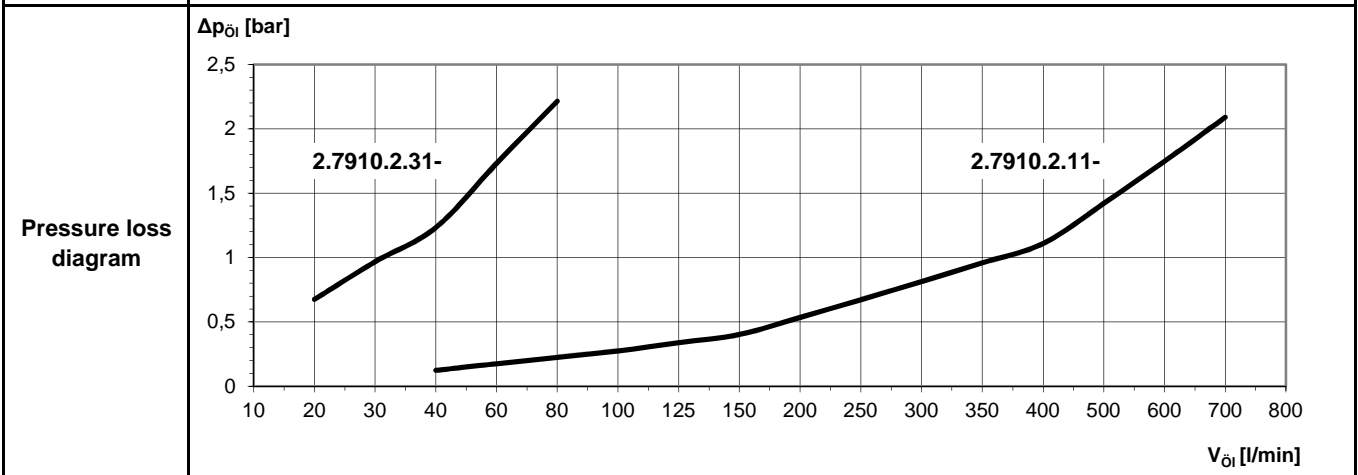
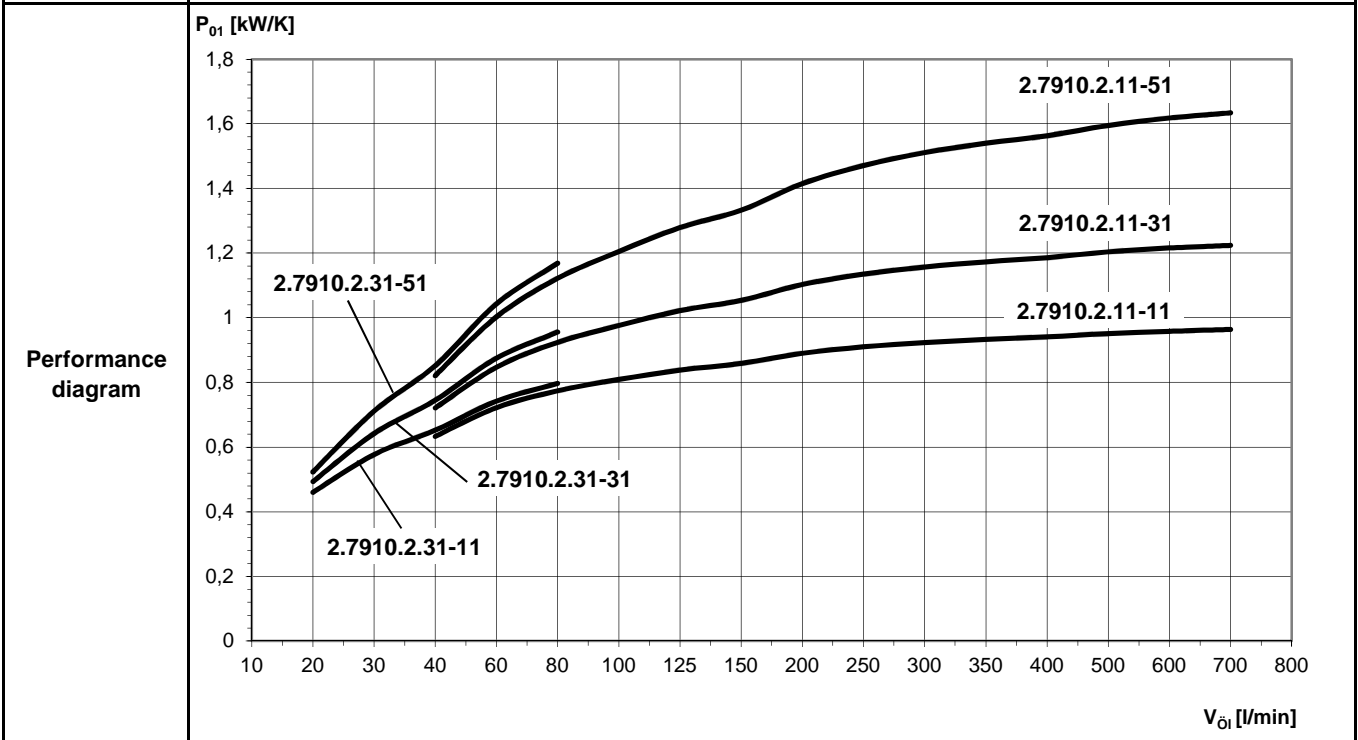
Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\Delta \leq 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7910.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	0,5	0,5	0,5
	Fan speed	1/min	1500	1000	750
	Fan load	kW	1,61	0,44	0,15
	Air flow	kg/s	3	1,9	1,4
	Motor power	kW	3,0 [IE3]	1,1 [IE3]	0,55 [IE1]
	Motor class		400VD / 690VY 50Hz 460VD 60 Hz	230VD / 400VY 50Hz 460VY 60 Hz	
	Motor frame size / type / flange		100L / IM B14 / C160	90L / IM B14 / C140	
	degree of protection / insulation (motor)		IP 55 / F(155) - B(130)		
	Total weight with motor	kg	92	81	75
	Weight without motor	kg	62	62	62
	Oil content	l	9,7	9,7	9,7
	Noise level 1m/7m *	db(A)	91 / 79	80 / 68	74 / 62
Standard-Cooler	Type: ZNo.	2.7910.2.11-51.01.00 210 002 747 0	2.7910.2.11-31.00.00 210 002 010 0	2.7910.2.11-11.00.00 210 002 513 0	
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium Fan: Plastic	Fan shroud: Other parts:	Steel (zinc plated) Steel (zinc plated)		
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by ± 4 db due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

Introduction	1. Following data are known:	2. From the following can be calculated:
	Dissipation loss P_V [kW] Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.	Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K] 3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]

Example	Given: $P_V = 62 \text{ kW}$; $V_{\dot{O}i} = 150 \text{ l/min}$; $t_{\dot{O}iE} = 80 \text{ °C}$; $t_{LE} = 30 \text{ °C}$
	Calculated: $ETD = 80 - 30 = 50 \text{ K}$ $P_{01} = \frac{62 \text{ kW}}{50 \text{ K}} = 1,24 \text{ kW/K}$
	Select: 2.7910.2.11 - 51.□□ (see performance diagram) $P_{01} = 1,3 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 50 \text{ K} \cdot 1,3 \text{ kW/K} = 65 \text{ kW}$
Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 65}{150} = 15,6 \text{ K}$; $\Delta t_L = \frac{65}{3} = 21,7 \text{ K}$	



Δp_{Oi} - Correction

The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\approx 32 \text{ cSt}$).
For differing viscosities, the Δp -value has to be multiplied by the factor f.

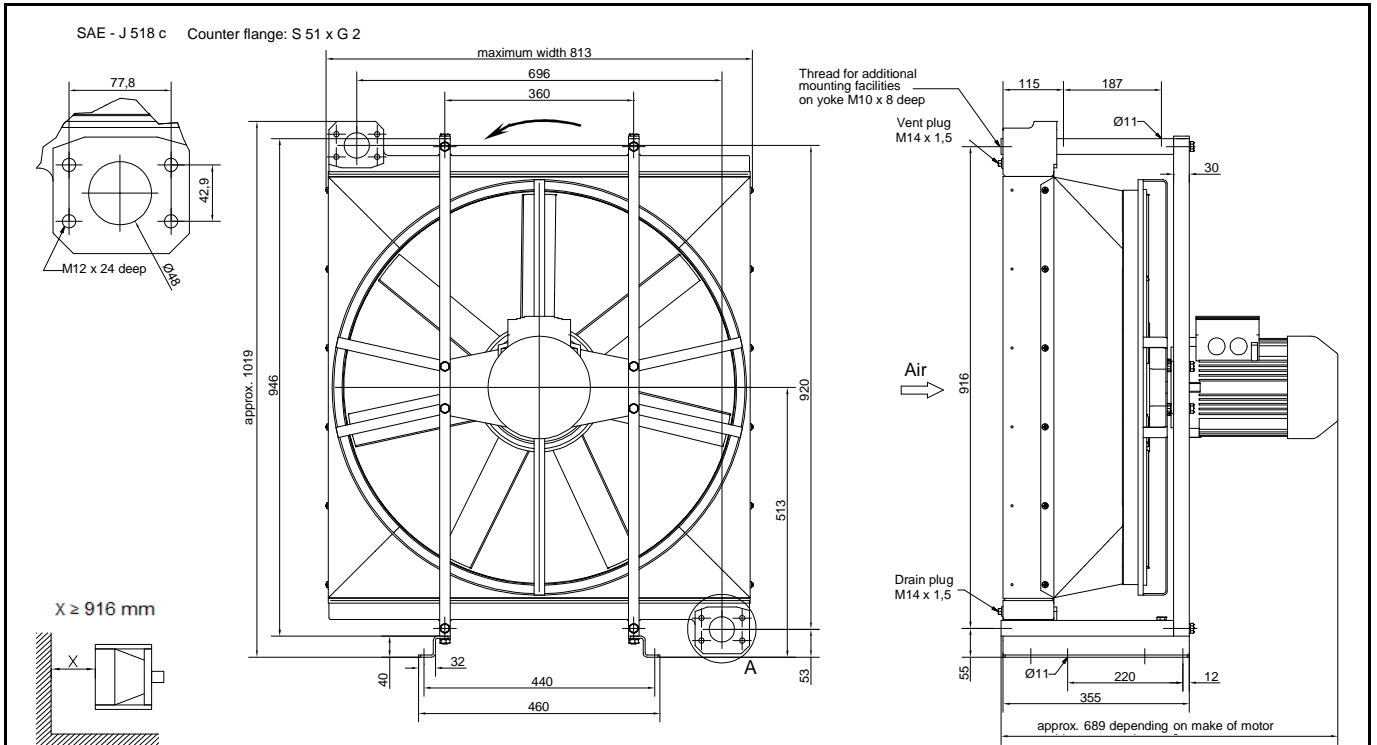
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f

OKAN 2.79 Size 11 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7911.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\approx 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7911.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	0,6	0,6	0,6
	Fan speed	1/min	1500	1000	750
	Fan load	kW	2,07	0,63	0,25
	Air flow	kg/s	4,8	3,2	2,4
	Motor power	kW	4,0 [IE3]	1,5 [IE3]	0,75 [IE1]
	Motor class		400VD / 690VY 50Hz 460VD 60 Hz	230VD / 400VY 50Hz 460VY 60 Hz	
	Motor frame size / type / flange		112M / IM B14 / C160	100L / IM B14 / C160	
	degree of protection / insulation (motor)		IP 55 / F(155) - B(130)		
	Total weight with motor	kg	132	123	117
	Weight without motor	kg	98	98	98
	Oil content	l	11	11	11
	Lautstärke 1m/7m *	db(A)	92 / 80	82 / 70	76 / 64
Standard-Cooler	Type: Zno.	2.7911.2.11-51.01.00 210 002 749 0	2.7911.2.11-31.07.00 210 001 897 0	2.7911.2.11-11.00.00 210 002 565 0	
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium Fan: Plastic	Fan shroud: Other parts:	Steel (zinc plated) Steel (zinc plated)		
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by $\pm 4 \text{ db}$ due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

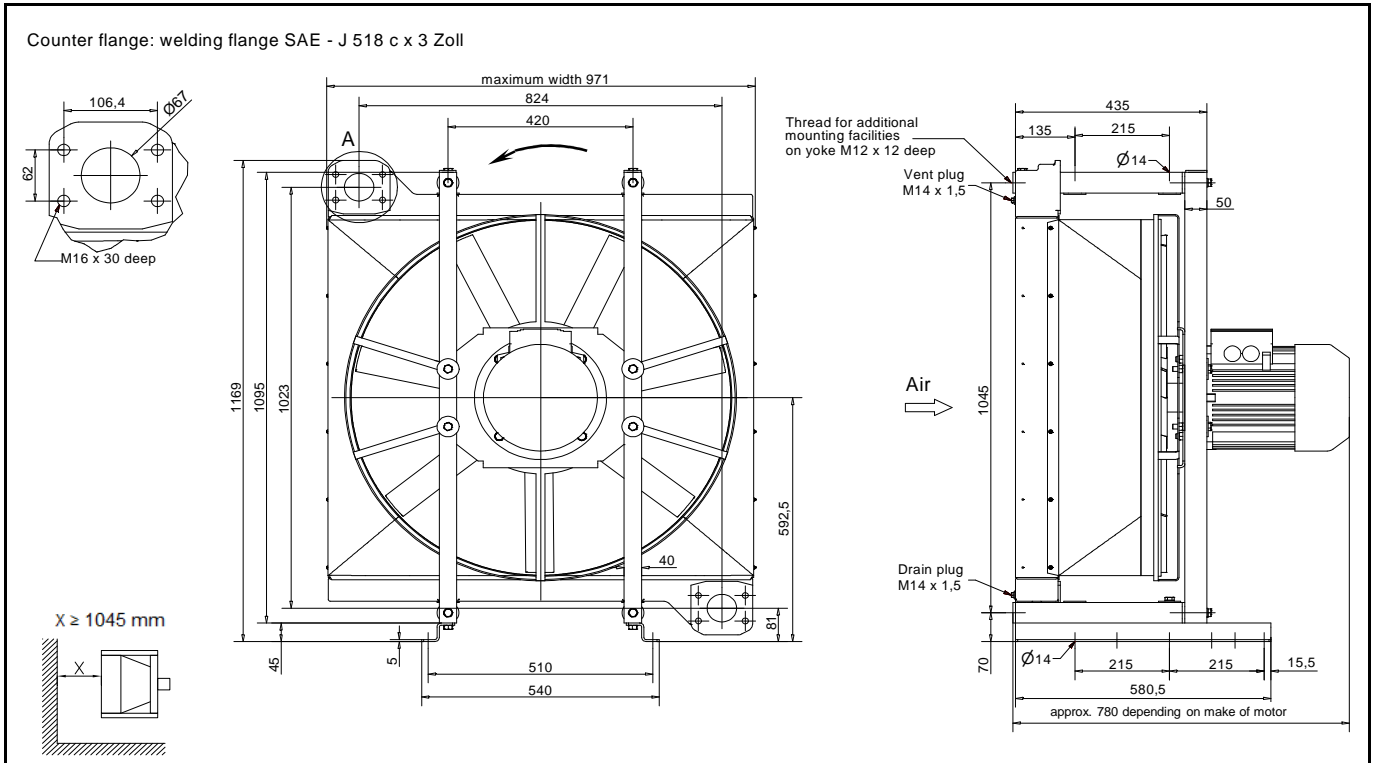
<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 75 \text{ kW}$; $V_{\dot{O}i} = 200 \text{ l/min}$; $t_{\dot{O}iE} = 70 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 70 - 30 = 40 \text{ K}$ $P_{01} = \frac{75 \text{ kW}}{40 \text{ K}} = 1,875 \text{ kW/K}$</p> <p>Select: 2.7911.2.11 - 51.□□ (see performance diagram) $P_{01} = 1,9 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 40 \text{ K} \cdot 1,9 \text{ kW/K} = 76 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 76}{200} = 13,7 \text{ K}$; $\Delta t_L = \frac{76}{4,8} = 15,8 \text{ K}$</p>																																
<p>Performance diagram</p>																																	
<p>Pressure loss diagram</p>																																	
<p>Δp_{Oi} - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\approx 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																		

OKAN 2.79 Size 13 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7913.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

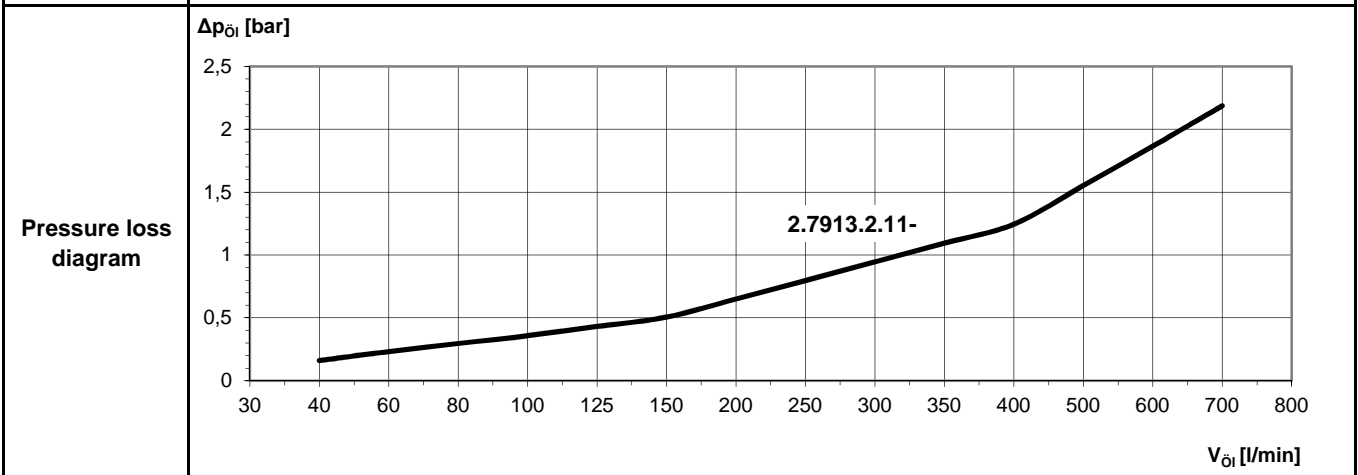
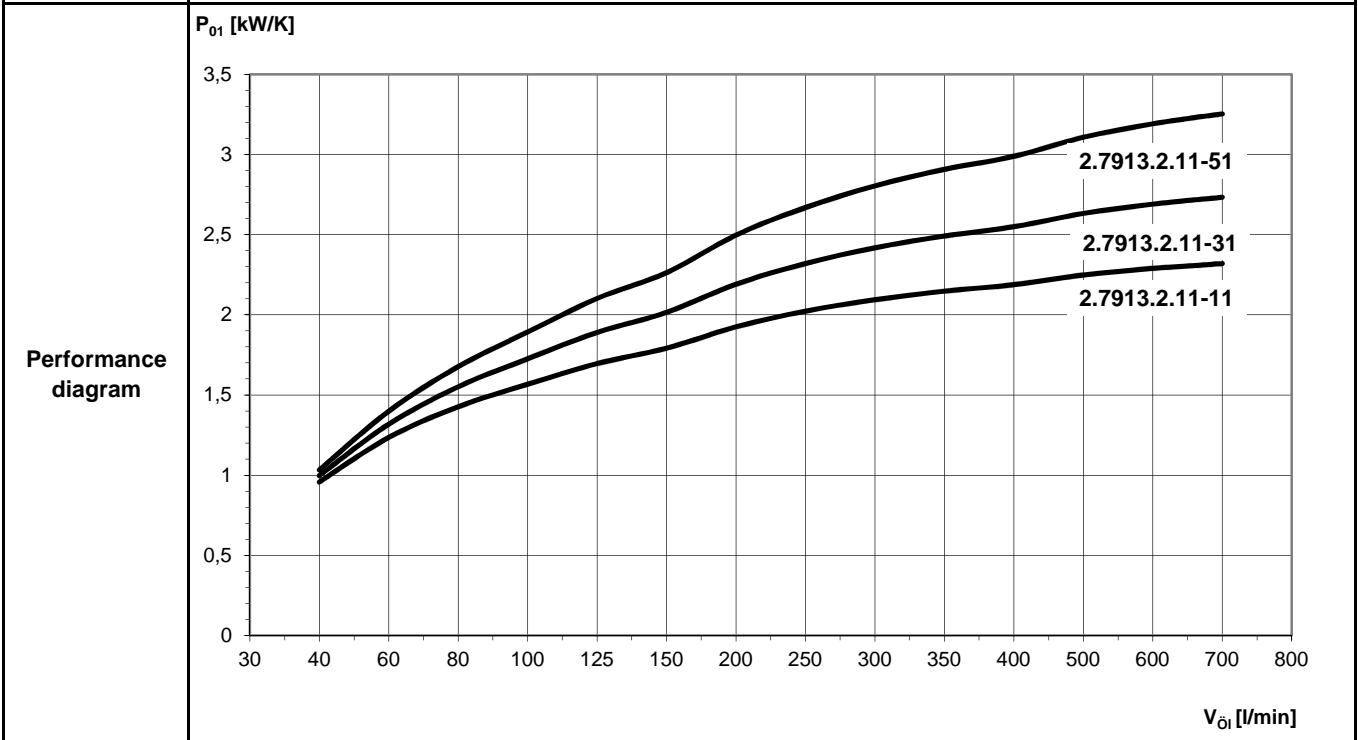
Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\approx 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7913.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	0,8	0,8	0,8
	Fan speed	1/min	1500	1000	750
	Fan load	kW	3,49	1,71	0,76
	Air flow	kg/s	7,4	5,4	4,1
	Motor power	kW	4,0 [IE3]	3,0 [IE3]	2,2 [IE1]
	Motor class		400VD / 690VY 50Hz 460VD 60 Hz		230VD / 400VY 50Hz 460VY 60 Hz
	Motor frame size / type / flange		112M / IM B14 / C160		IM B5 / 132S
	degree of protection / insulation (motor)		IP 55 / F(155) - B(130)		
	Total weight with motor	kg	161	170	165
	Weight without motor	kg	127	127	127
	Oil content	l	18	18	18
	Noise level 1m/7m *	db(A)	92 / 80	85 / 73	79 / 67
Standard-Kühler	Type: ZNo.	2.7913.2.11-51.01.00 210 002 745 0	2.7913.2.11-31.01.00 210 002 746 0	2.7913.2.11-11.07.00 210 001 938 0	
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium Fan: Plastic	Fan shroud: Other parts:	Steel (zinc plated) Steel (zinc plated)		
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by ± 4 db due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue:01.2017

Introduction	1. Following data are known:	2. From the following can be calculated:
	Dissipation loss P_V Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.	Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K] 3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]

Example	Given: $P_V = 95 \text{ kW}$; $V_{\dot{O}i} = 500 \text{ l/min}$; $t_{\dot{O}iE} = 70 \text{ °C}$; $t_{LE} = 30 \text{ °C}$
	Calculated: $ETD = 70 - 30 = 40 \text{ K}$
	$P_{01} = \frac{95 \text{ kW}}{40 \text{ K}} = 2.4 \text{ kW/K}$
	Select: 2.7913.2.11 - 31.□□ (see performance diagram) $P_{01} = 2.6 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 40 \text{ K} \cdot 2.6 \text{ kW/K} = 104 \text{ kW}$
Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 104}{500} = 7.5 \text{ K}$; $\Delta t_L = \frac{104}{5.4} = 19.3 \text{ K}$	



Δp_{Oi} - Correction

The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\approx 32 \text{ cSt}$).
For differing viscosities, the Δp -value has to be multiplied by the factor f.

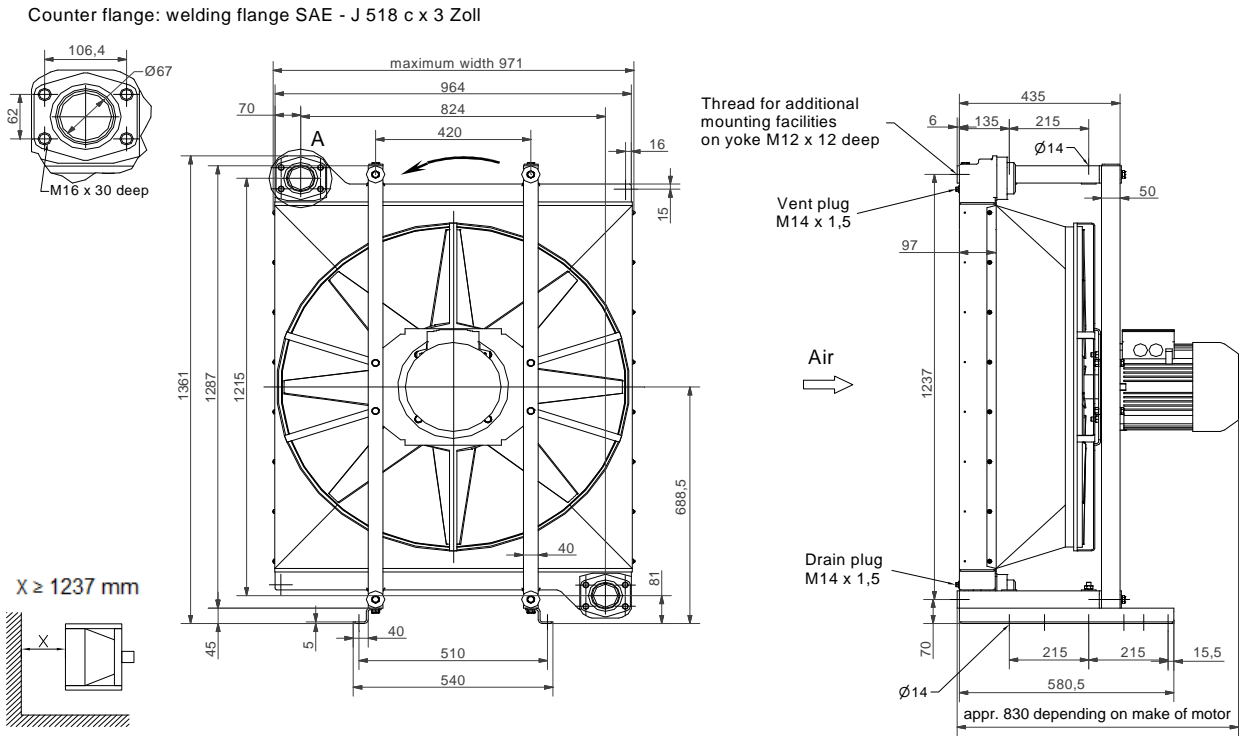
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f

OKAN 2.79 Size 14 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7914.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\approx 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7914.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	1,0	1,0	1,0
	Fan speed	1/min	1500	1000	750
	Fan load	kW	7,27	2,38	0,92
	Air flow	kg/s	10	6,6	4,9
	Motor power	kW	7,5 [IE3]	4,0 [IE3]	2,2 [IE1]
	Motor class		400VD / 690VY 50Hz 460VD 60 Hz		230VD / 400VY 50Hz 460VY 60 Hz
	Motor frame size / type / flange		IM B5 / 132M		IM B5 / 132S
	degree of protection / insulation (motor)		IP 55 / F(155) - B(130)		
	Total weight with motor	kg	198	185	171
	Weight without motor	kg	133	133	133
	Oil content	l	20	20	20
	Noise level 1m/7m *	db(A)	95 / 83	86 / 74	79 / 67
Standard-Cooler	Type: ZNo.	2.7914.2.11-51.01.00 210 002 748 0	2.7914.2.11-31.01.00 210 002 737 0	2.7914.2.11-11.07.00 210 001 871 0	
Max. working pressure	16 bar				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium Fan: Plastic	Fan shroud: Steel (zinc plated) Other parts: Steel (zinc plated)			
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by ± 4 db due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

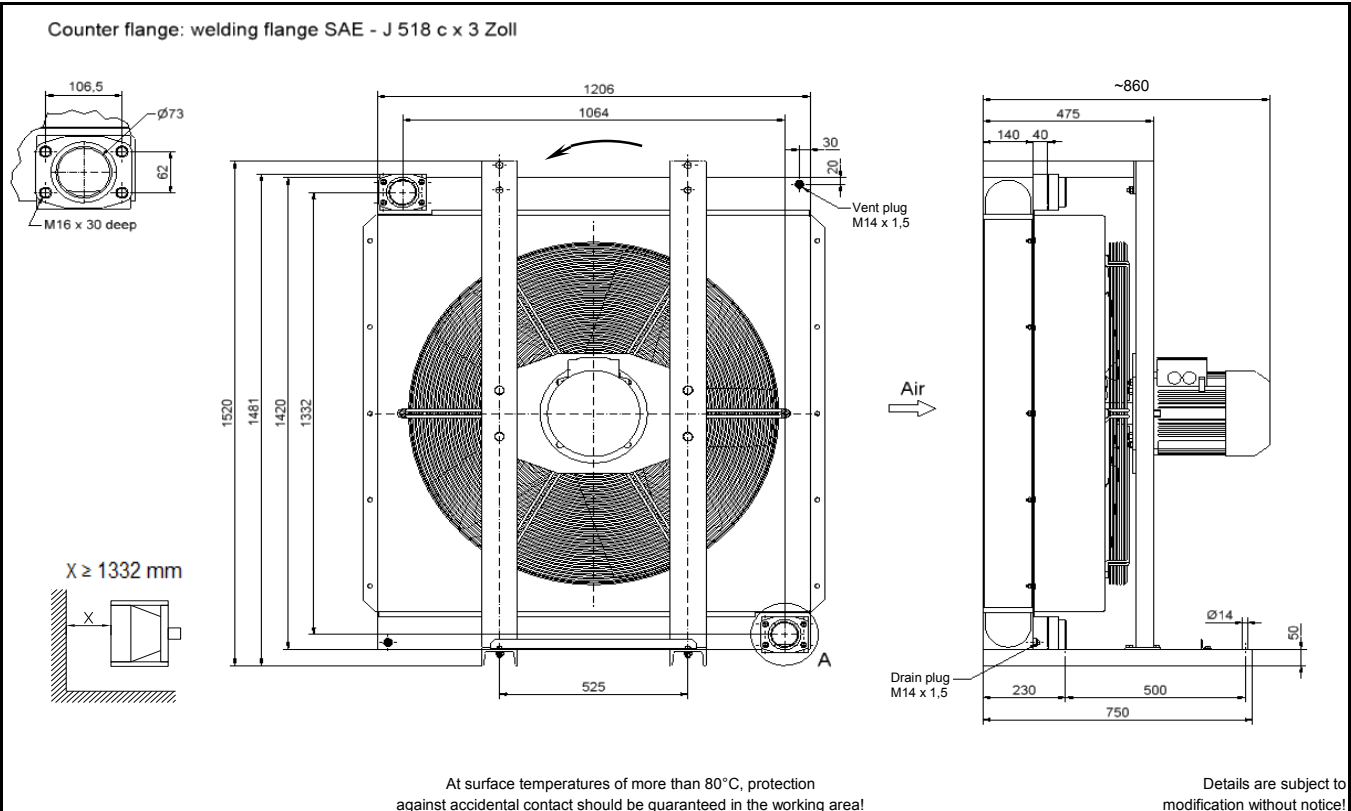
<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 85 \text{ kW}$; $V_{\dot{O}i} = 400 \text{ l/min}$; $t_{\dot{O}iE} = 60 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 60 - 30 = 30 \text{ K}$ $P_{01} = \frac{85 \text{ kW}}{30 \text{ K}} = 2,83 \text{ kW/K}$</p> <p>Select: 2.7914.2.11 - 31.□□ (see performance diagram) $P_{01} = 3,0 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 30 \text{ K} \cdot 3,0 \text{ kW/K} = 90 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{36 \cdot 90}{400} = 8,1 \text{ K}$; $\Delta t_L = \frac{90}{6,6} = 13,6 \text{ K}$</p>																																
<p>Performance diagram</p>																																	
<p>Pressure loss diagram</p>																																	
<p>Δp_{Oi} - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\approx 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																		

OKAN 2.79 Size 15 AC



Datasheet Oil / Air - Cooling Unit
OKAN 2.7915.2.□□ - □□.□□.□□

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Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\triangleq 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.7915.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	1,44	1,44	1,44
	Fan speed	1/min	1500	1000	750
	Fan load	kW	7,5	3,06	1,22
	Air flow	kg/s	12	8,5	6,3
	Motor power	kW	7,5 [IE3]	5,5 [IE3]	2,2 [IE1]
	Motor class		400VD / 690VY 50Hz 460VD 60 Hz		230VD / 400VY 50Hz 460VY 60 Hz
	Motor frame size / type / flange		IM B5 / 132M		IM B5 / 132S
	degree of protection / insulation (motor)		IP 55 / F(155) - B(130)		
	Total weight with motor	kg	315	314	290
	Weight without motor	kg	250	250	250
	Oil content	l	55	55	55
	Noise level 1m/7m *	db(A)	99 / 87	95 / 83	88 / 76
	Standard-Cooler	Type: Zno.	2.7915.2.11-51.01.00 210 002 750 0	2.7915.2.11-31.01.00 210 002 567 0	2.7915.2.11-11.00.00 210 002 030 0
Max. working pressure	10 bar (static)				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium (painted RAL 7035) Fan: Plastic	Fan shroud: Other parts:	Steel (powder coated RAL 7035) Steel (zinc plated) / painted on request		
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by ± 4 db due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

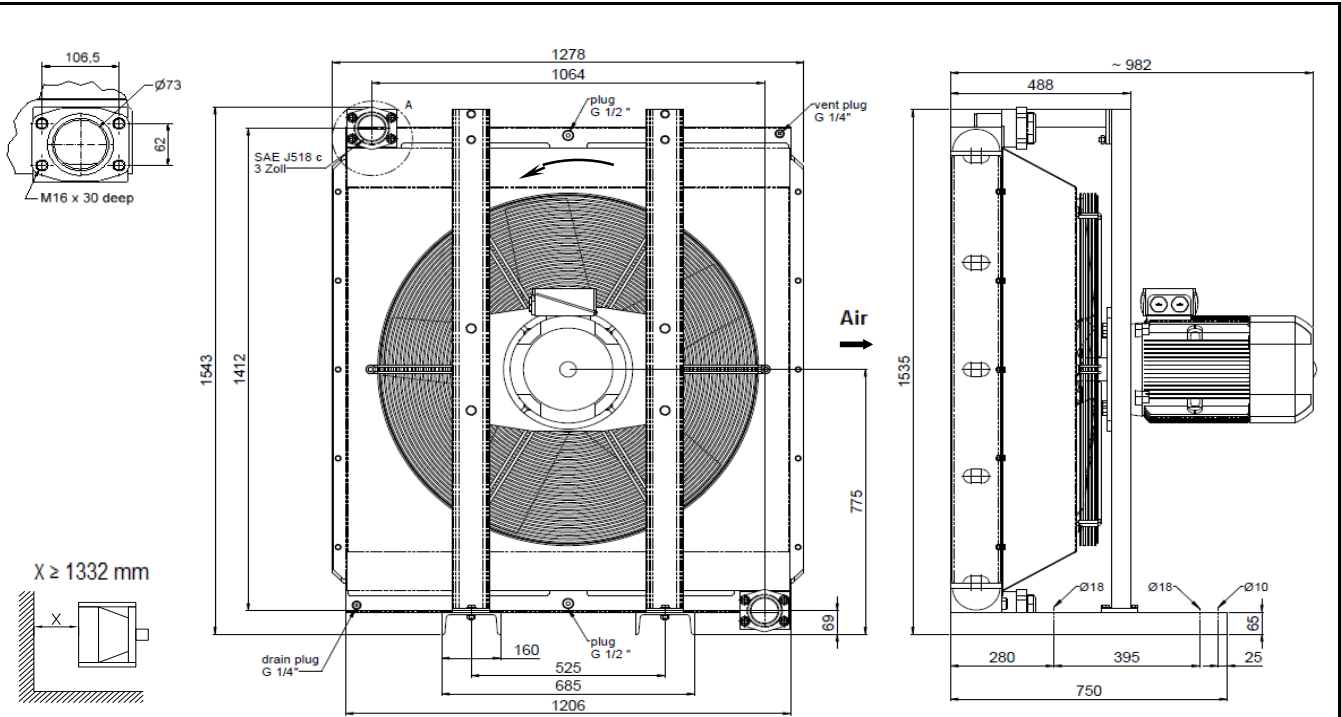
<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 135 \text{ kW}$; $V_{\dot{O}i} = 500 \text{ l/min}$; $t_{\dot{O}iE} = 60 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 60 - 30 = 30 \text{ K}$ $P_{01} = \frac{135 \text{ kW}}{30 \text{ K}} = 4.5 \text{ kW/K}$</p> <p>Select: <u>2.7915.2.11 - 31.□□</u> (see performance diagram) $P_{01} = 4.8 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 30 \text{ K} \cdot 4.8 \text{ kW/K} = 144 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{144 \cdot 36}{500} = 10.4 \text{ K}$; $\Delta t_L = \frac{144}{8.5} = 16.9 \text{ K}$</p>																																
<p>Performance diagram</p>																																	
<p>Pressure loss diagram</p>																																	
<p>Δp_{Oi} - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\triangleq 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1" data-bbox="384 1989 1307 2045"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																		

OKAN 2.81 Size 15 AC



Datasheet Oil / Air - Cooling Unit
 OKAN 2.8115.2.□□ - □□.□□.□□

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At surface temperatures of more than 80°C, protection against accidental contact should be guaranteed in the working area!

Details are subject to modification without notice!

Application	Cooling of oil, HFA,HFB, HFC, HFD - fluids up to $\nu \approx 100 \cdot 10^{-6} \text{ m}^2/\text{s}$ ($\triangleq 100 \text{ cSt}$), Water/Glycol 65:35, no water without corrosion preventive (min. 2 %). Cooling medium: Air				
Technical data	Type:	2.8115.2.□□ -	51.□□	31.□□	11.□□
	Face area	m ²	1,52	1,52	1,52
	Fan speed	1/min	1500	1000	750
	Fan load	kW	7,5	3,06	1,22
	Air flow	kg/s	12	8,5	6,3
	Motor power	kW	11,0 [IE3]	5,5 [IE3]	2,2 [IE1]
	Motor class		400VD / 690VY 50Hz 460VD 60 Hz		230VD / 400VY 50Hz 460VY 60 Hz
	Motor frame size / type / flange		IM B5 / 160L	IM B5 / 132M	IM B5 / 132S
	degree of protection / insulation (motor)		IP 55 / F(155) - B(130)		
	Total weight with motor	kg	345	324	300
	Weight without motor	kg	260	260	260
	Oil content	l	46	46	46
	Noise level 1m/7m *	db(A)	99 / 87	95 / 83	88 / 76
Standard-Cooler	Type: Zno.	2.8115.2.11-51.02.00 210 002 906 0	2.8115.2.11-31.01.00 210 002 800 0	2.8115.2.11-11.00.00 210 002 801 0	
Max. working pressure	16 bar (static)				
Max. working temp.	Oil and hydraulic fluids 100 °C ** water/glycol, emulsion 90 °C		Ambient temperature -20°C until +40°C **		
Material	Cooler: Aluminium (painted RAL 7035) Fan: Plastic	Fan shroud: Other parts:	Steel (powder coated RAL 7035) Steel (zinc plated) / painted on request		
Installation instruction	Refer to: Datasheet, operation and assembly manual. Ensure there is an unhindered flow of air to and from the cooler. Provide ventilation and exhaust in room where cooler is installed. Avoid a pulsating oil flow and pressure surges.				
Hint	* May vary by ± 4 db due to room characteristics, own frequencies, oil connections, viscosities etc. ** Please contact our technical support department at different temperatures.				

Issue: 01.2017

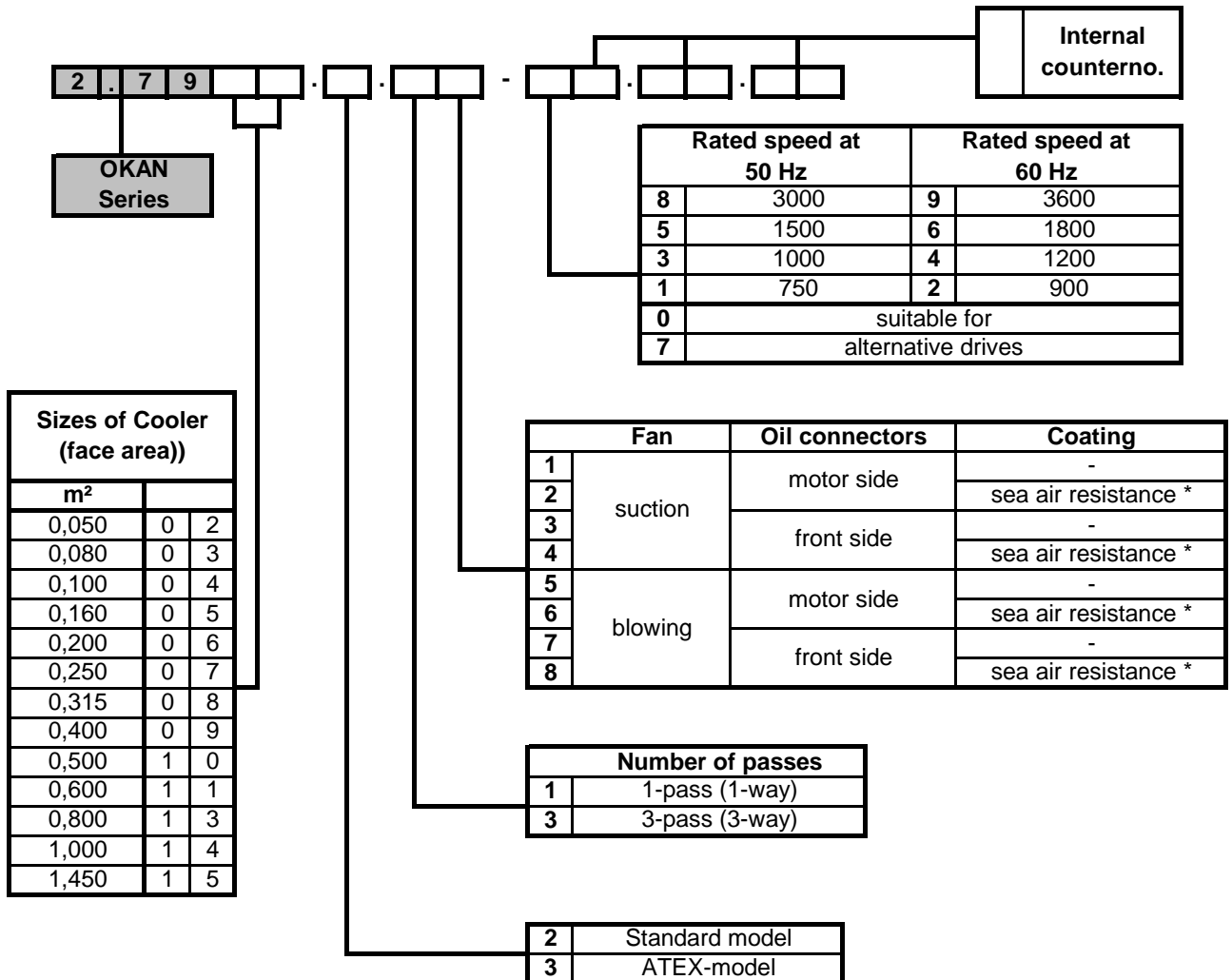
<p>Introduction</p>	<p>1. Following data are known: Dissipation loss P_V Oil flow $V_{\dot{O}i}$ [l/min] Cooler oil inlet temperature $t_{\dot{O}iE}$ [°C] Cooling air temperature t_{LE} [°C] Air flow (see technical data) G_L [kg/s] In hydraulic systems, the dissipation loss is approximately 20 – 25 % of drive power.</p> <p>2. From the following can be calculated: Entry - Temperature - Difference $ETD = t_{\dot{O}iE} - t_{LE}$ [K] Specific cooling capacity $P_{01} = P_V / ETD$ [kW/K]</p> <p>3. After selection of cooling unit can be calculated: Air heating $\Delta t_L = P_V / G_L$ [K] Oil cooling $\Delta t_{\dot{O}L} = 36 \cdot P_V / V_{\dot{O}i}$ [K]</p>																																
<p>Example</p>	<p>Given: $P_V = 135 \text{ kW}$; $V_{\dot{O}i} = 500 \text{ l/min}$; $t_{\dot{O}iE} = 60 \text{ °C}$; $t_{LE} = 30 \text{ °C}$</p> <p>Calculated: $ETD = 60 - 30 = 30 \text{ K}$ $P_{01} = \frac{135 \text{ kW}}{30 \text{ K}} = 4.5 \text{ kW/K}$</p> <p>Select: <u>2.8115.2.11 - 31.□□</u> (see performance diagram) $P_{01} = 4.9 \text{ kW/K}$; $P_V = ETD \cdot P_{01} = 30 \text{ K} \cdot 4.9 \text{ kW/K} = 147 \text{ kW}$</p> <p>Calculated: $\Delta t_{\dot{O}i} = \frac{147 \cdot 36}{500} = 10.6 \text{ K}$; $\Delta t_L = \frac{147}{8.5} = 17.3 \text{ K}$</p>																																
<p>Performance diagram</p>																																	
<p>Pressure loss diagram</p>																																	
<p>Δp_{Oi} - Correction</p>	<p>The Δp -value obtained from the curves applies for $\nu = 32 \text{ mm}^2/\text{s}$ ($\triangleq 32 \text{ cSt}$). For differing viscosities, the Δp -value has to be multiplied by the factor f.</p> <table border="1"> <tr> <td>10</td><td>15</td><td>20</td><td>32</td><td>40</td><td>50</td><td>60</td><td>80</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td><td>400</td><td>500</td><td>mm²/s</td> </tr> <tr> <td>0,5</td><td>0,65</td><td>0,75</td><td>1,0</td><td>1,2</td><td>1,4</td><td>1,6</td><td>2,1</td><td>2,7</td><td>4,0</td><td>5,5</td><td>7,3</td><td>9,5</td><td>16</td><td>30</td><td>f</td> </tr> </table>	10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s	0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f
10	15	20	32	40	50	60	80	100	150	200	250	300	400	500	mm ² /s																		
0,5	0,65	0,75	1,0	1,2	1,4	1,6	2,1	2,7	4,0	5,5	7,3	9,5	16	30	f																		

Model code



Oil / Air - Cooling Unit
OKAN 2.79 AC / 2.81 AC

www.funke.de



Example 2.7908.2.12-54.88.29

2 . 7 9 0 8 . 2 . 1 4 - 5 4 . 8 8 . 2 9

OKAN 2.79
Size: 08
Standard model: 2
Number of passes: 1-pass (1-way)
Fan suction, Oil connectors fronte side, Painting sea air resistance
Rated speed: 1500 rpm
Internal counterno.

Standard equipment

Oil / Air - Cooling Unit including SAE - flanges (mounted), documentation

Coating

* sea air resistant coating = C3 according DIN ISO 12944/2, C5M on request;

Issue: 06.2015