



System Protectors, Moisture Indicators

Filter Driers

Basic terminology and technical information

Function

The purpose of filter driers is to keep the refrigeration circuit clean of water, acid and solid contaminants. In case of contamination, corrosion and ice building can occur, as well as malfunction of the compressor.

Property of desiccants

Molecular sieves

This kind of desiccant has a very good drying effect independent of the oil content of the refrigerant. Molecular sieve is a fast acting desiccant and will remove moisture even when the water content of the refrigerant is low and when the temperature of the liquid refrigerant is high.

Activated alumina

Activated alumina incorporate an excellent acid capacity.

By selecting a specific mixture of both desiccants an optimum effect can be achieved to cover the requirements of all kinds of applications. Liquid filter driers are especially designed for a high water capacity whereas suction line filter driers feature a high acid and filtration capacity.

Flow capacity

Flow capacity refers to ARI-Standard 710-86 and DIN 8949 and is based on a pressure drop of 0.07 bar, +30°C liquid temperature and -15°C evaporating temperature.

The flow capacities are given at two levels of pressure drop: 0.07 and 0.14 bar.

Filter drier selection for operating conditions other than +30°C / -15°C, use the correction factors on page 100 ... 101.

Water capacity

The water capacity for R 22 refers to ARI 710-86 and DIN8948 is based on a liquid temperature of 24/52°C and an equilibrium point dryness (EPD) of 60 PPM water in refrigerant. The EPD for other refrigerants according to DIN 8949 is as follows:

Refrigerant	EPD (PPM)
R 134a	50
R 407C	50
R 404A	50
R 507	50
R 410A	50

Selection Guide for Filter and Filter Driers


Selection criteria	Series									
	ADK-Plus	BFK	ADKS - Plus with core H/S/W 48	FDS-24 with core		FDS-48 with core H/S/W 48	ASF-Plus	ASD-Plus	BTAS with core	
				F24	S 24				AF	AF - D
Hermetic design	+	+					+	+		
For exchangeable cores			+	+	+	+			+	+
Filter				+			+		+	
Filter drier	+	+	+		+	+		+		+
For liquid service	+	+	+		+	+				
For suction service				+	+		+	+	+	+
For Heat Pumps (Bi-Flow)		+								
Shell material	Steel	Steel	Steel	Steel		Steel	Steel	Steel	Brass	
Catalogue page	95	*	97	98		99	102	102	103	

* Ask your ALCO wholesaler for datasheet

Filter Driers Series ADK-Plus

Hermetic Design, for Liquid Refrigerants

Features

- Robust block with optimum blend of molecular sieve and activated alumina
- ODF Copper fittings for easy soldering
- High water and acid capacity
- Filtration down to 25 micron
- Temperature range TS: -40°C to +65°C
- Max. working pressure PS: 43 bar
- No CE marking according art. 3.3 PED 97/23 EC
- HP marking according to German Pressorized Vessel Directive
-  Underwriter Laboratories



ADK-Plus

Type ADK	Order No.	Nominal Flow Capacity (kW)									
		at 0,14 bar pressure drop					at 0,07 bar pressure drop				
		R 22	R 134a	R 404A/R507	R 407C	R 410A	R 22	R 134a	R 404A/R507	R 407C	R 410A
032	003 595	10,6	9,7	6,9	10,1	10,5	7,3	6,7	4,8	7,0	7,2
036MMS	003 597	12,0	11,0	7,8	11,4	11,8	8,0	7,3	5,2	7,6	7,9
032S	003 596	12,9	11,8	8,4	12,3	12,7	8,8	8,1	5,7	8,4	8,7
052	003 598	11,0	10,1	7,2	10,5	10,9	7,6	6,9	4,9	7,2	7,5
056MMS	003 600	15,0	13,7	9,8	14,3	14,8	10,0	9,2	6,5	9,5	9,9
052S	003 599	17,1	15,6	11,1	16,3	16,9	10,8	9,9	7,0	10,3	10,7
053	003 601	21,3	19,5	13,9	20,3	21,0	14,2	13,0	9,2	13,5	14,0
0510MMS	003 603	24,1	22,1	15,7	23,0	23,8	16,4	15,0	10,7	15,6	16,1
053S	003 602	24,1	22,1	15,7	23,0	23,8	16,4	15,0	10,7	15,6	16,1
082	003 604	11,3	10,4	7,4	10,8	11,2	7,8	7,1	5,1	7,4	7,7
086MMS	003 606	16,0	14,7	10,4	15,3	15,8	10,7	9,8	7,0	10,2	10,5
082S	003 605	17,3	15,9	11,3	16,5	17,1	11,9	10,9	7,8	11,4	11,8
083	003 607	23,9	21,9	15,6	22,8	23,6	16,4	15,0	10,7	15,6	16,2
0810MMS	003 609	24,1	22,1	15,7	23,0	23,8	16,4	15,0	10,7	15,6	16,2
083S	003 608	24,1	22,1	15,7	23,0	23,8	16,4	15,0	10,7	15,7	16,2
084	003 610	39,1	35,8	25,5	37,3	38,6	25,7	23,5	16,7	24,5	25,3
0812MMS	003 612	39,5	36,2	25,8	37,7	39,0	26,3	24,1	17,2	25,1	26,0
084S	003 611	40,4	37,0	26,3	38,5	39,8	26,8	24,5	17,5	25,6	26,4
162	003 613	11,5	10,5	7,5	10,9	11,3	8,0	7,3	5,2	7,6	7,8
163	003 614	24,1	22,1	15,7	23,0	23,8	16,8	15,4	10,9	16,0	16,5
1610MMS	003 616	26,8	24,5	17,5	25,6	26,5	18,7	17,1	12,2	17,8	18,5
163S	003 615	26,8	24,5	17,5	25,6	26,5	18,7	17,2	12,2	17,9	18,5
164	003 617	47,1	43,2	30,7	45,0	46,5	31,3	28,7	20,4	29,9	30,9
1612MMS	003 619	48,5	44,4	31,6	46,3	47,9	32,3	29,6	21,1	30,8	31,9
164S	003 618	49,9	45,7	32,6	47,6	49,3	36,0	33,0	23,5	34,3	35,5
165	003 620	66,5	60,9	43,4	63,5	65,7	44,8	41,1	29,2	42,8	44,3
165S	003 621	72,4	66,3	47,2	69,1	71,5	49,7	45,6	32,4	47,4	49,1
303	003 622	25,4	23,2	16,5	24,2	25,0	17,7	16,2	11,5	16,9	17,5
304	003 623	47,1	43,2	30,7	45,0	46,5	31,3	28,7	20,4	29,9	30,9
304S	003 624	51,6	47,2	33,6	49,2	50,9	36,0	33,0	23,5	34,4	35,6
305	003 626	72,1	66,0	47,0	68,7	71,1	52,6	48,2	34,3	50,2	52,0
305S	003 627	72,9	66,8	47,6	69,6	72,0	52,8	48,4	34,4	50,4	52,1
307S	003 628	104,6	95,8	68,2	99,8	103,2	66,3	60,7	43,2	63,2	65,4
414	003 629	55,2	50,6	36,0	52,7	54,5	36,8	33,7	24,0	35,1	36,3
415	003 632	87,9	80,5	57,3	83,9	86,8	58,6	53,7	38,2	55,9	57,8
415S	003 633	94,5	86,6	61,6	90,2	93,3	63,0	57,7	41,1	60,1	62,2
417S	003 634	116,9	107,1	76,2	111,5	115,4	77,9	71,4	50,8	74,3	76,9
757S	003 635	158,3	145,0	103,2	151,0	156,2	105,5	96,7	68,8	100,7	104,2
759S	003 636	175,8	161,0	114,6	167,7	173,5	117,2	107,4	76,4	111,8	115,7

Correction factors for other than the nominal conditions see page 100.



Connections

Type ADK	Order No.	Connection			
		Solder/ODF		Flare/SAE	
		mm	inch	mm	inch
032	003 595			6	1/4
036MMS	003 597	6			
032S	003 596		1/4		
052	003 598			6	1/4
056MMS	003 600	6			
052S	003 599		1/4		
053	003 601			10	3/8
0510MMS	003 603	10			
053S	003 602		3/8		
082	003 604			6	1/4
086MMS	003 606	6			
082S	003 605		1/4		
083	003 607			10	3/8
0810MMS	003 609	10			
083S	003 608		3/8		
084	003 610			12	1/2
0812MMS	003 612	12			
084S	003 611		1/2		
162	003 613			6	1/4
163	003 614			10	3/8

Type ADK	Order No.	Connection			
		Solder/ODF		Flare/SAE	
		mm	inch	mm	inch
1610MMS	003 616	10			
163S	003 615		3/8		
164	003 617			12	1/2
1612MMS	003 619	12			
164S	003 618		1/2		
165	003 620			16	5/8
165S	003 621		5/8		
303	003 622			10	3/8
304	003 623			12	1/2
304S	003 624		1/2		
305	003 626			16	5/8
305S	003 627		5/8		
307S	003 628	22	7/8		
414	003 629			12	1/2
415	003 632			16	5/8
415S	003 633		5/8		
417S	003 634	22	7/8		
757S	003 635	22	7/8		
759S	003 636		1-1/8		

Water and Acid Capacity

Size	Water adsorption capacity (gram)										Acid Adsorption Capacity (gram)
	Liquid Temperature 24°C					Liquid Temperature 52°C					
	R 134a	R 22	R 404A/R 507	R 407C	R 410A	R 134a	R 22	R 404A/R 507	R 407C	R 410A	
ADK03	4,9	4,5	4,9	3,4	2,8	4,4	4,0	4,6	2,9	2,4	0,8
ADK05	11,8	10,8	11,8	8,2	6,8	10,6	9,6	10,9	7,0	5,8	2,3
ADK08	17,9	16,4	18,0	12,4	10,3	16,2	14,6	16,6	10,7	8,8	3,3
ADK16	23,0	21,0	23,1	16,0	13,2	20,8	18,8	21,3	13,8	11,4	4,5
ADK30	51,8	48,6	53,5	36,9	30,6	47,4	43,3	49,3	31,8	26,3	11,3
ADK41	81,7	76,6	84,3	58,2	48,3	74,8	68,3	77,8	50,2	41,4	16,8
ADK75	143,5	134,5	148,1	102,1	84,8	131,4	120,0	136,6	88,1	72,8	29,9

Filter Drier Shells Series ADKS-Plus

For Liquid Refrigerants with Replaceable Cores

Features of Shells

- Rustproof Aluminum flange cover with notch hole for ease of mounting
- Rigid core holder from steel (no plastic)
- Service friendly core holder and flange cover
- Optimum flow capacity at low pressure drop
- ODF Copper fittings for easy soldering
- Temperature range TS: -45°C to +65°C
- Max. working pressure PS:
 - 34,5 bar (-10°C to +65°C)
 - 25,9 bar (-45°C to -10°C)
- CE marking according PED 97/23 EC



ADKS-Plus



Core S48

Type ADKS- Plus	Order- No.	Connection Solder/ODF mm inch		Nominal Flow Capacity (kW)										Number of Blocks S48, H48 W48, F48
				Pressure Drop 0,07 bar					Pressure Drop 0,14 bar					
				R 22	R 134a	R 507/ R 404A	R 407C	R 410A	R 22	R 134a	R 507/ R 404A	R 407C	R 410A	
Conformity assessment cat. I, procedure module D1 (applied higher module as required)														
485T	883 551	16	5/8"	78	72	51	75	77	100	92	65	95	99	1
487T	883 552	22	7/8"	145	133	95	138	143	182	167	119	174	180	
489T	883 553		1-1/8"	204	187	133	195	202	262	240	171	250	258	
4811T	883 554	35	1-3/8"	285	261	186	272	281	355	325	231	338	350	
4813TMM	883 836	42		310	284	202	296	306	390	357	254	372	385	
4817	882 603	54	2-1/8"	Primary for suction line applications										2
967T	883 555	22	7/8"	159	146	104	152	157	199	182	129	189	196	
969T	883 556		1-1/8"	250	229	163	239	247	300	275	196	286	296	
9611T	883 557	35	1-3/8"	305	279	199	291	301	402	369	262	384	397	
9613T	883 558		1-5/8"	350	321	228	334	345	470	431	306	448	464	
9613TMM	883 559	42		355	325	231	339	350	480	440	313	458	474	
9617	887 215	54		350	321	228	334	345	470	431	306	448	464	
1449T	883 560		1-1/8"	252	231	165	241	249	313	287	204	299	309	
14411T	883 561	35	1-3/8"	351	322	229	335	347	438	401	285	417	432	
14413T	883 562		1-5/8"	354	325	231	338	350	482	441	314	460	476	
14413TMM	883 563	42		360	330	235	343	355	490	449	319	467	484	
14417T	883 564	54	2-1/8"	420	385	274	401	415	560	513	365	534	553	
Conformity assessment cat. II, procedure module D1														
19211T	883 565	35	1-3/8"	358	328	233	342	353	440	403	287	419	434	4
19213T	883 566		1-5/8"	395	362	258	377	390	506	464	330	483	500	
19213TMM	883 567	42		400	366	261	382	395	510	467	333	487	503	
19217T	883 568	54	2-1/8"	430	394	281	411	425	567	519	370	541	560	

Correction factors for other than the nominal conditions see page 100 ... 101.

Cores for ADKS-Plus have to be ordered separately.

Size	Order No.	Water adsorption capacity (gram)								Acid Adsorption Capacity (gram)
		Liquid Temperature 24°C				Liquid Temperature 52°C				
		R134a	R22	R404A/R507	R407C	R134a	R22	R404A/R507	R407C	
S48	003 508	79,7	74,7	82,3	56,7	73,0	66,7	75,9	48,9	16,3
H48	006 969	35,0	31,7	37,0	24,4	29,0	24,5	28,9	18,1	44,6
W48	006 970	24,7	22,1	26,2	17,1	19,9	16,4	19,5	12,1	39,7
F 48	006 973	Filter								
H/F/W100 are for use with phased-out ADKS-300 / -400 only										
F 100	006 974	Filter								
H100	006 971	59,9	53,3	63,8	41,2	47,4	38,3	46,0	28,5	105,1
W100	006 972	52,7	47,1	56,0	36,4	42,4	34,7	41,4	25,7	85,5

Filter-Drier Shells With Quick-Cap, Series FDS-24

for Liquid-and Suction Applications with Replaceable Cores

Features

- Quick-cap flange (one bolt) design makes replacing of cores in a matter of seconds
- Ideal for retrofit, reducing installation / material cost
- Ideal for refrigerant recovery / reclaim units with regular change of filter-drier
- Compatible with CFC, HCFC and HFC refrigerants
- Free volume as a receiver in FDS-24... (580 cm³)
- ODF Copper fittings for easy soldering
- Corrosion resistant powder painting of shell body
- Temperature range TS: -45°C to +65°C
- Max. working pressure PS:
 - 34,5 bar (-10°C to +65°C)
 - 25,9 bar (-45°C to -10°C)
- No CE marking according art.3.3 PED 97/23 EC
- HP marking according to German Pressorized Vessel Directive



Selection Chart Suction Application

Type	Order-No.	Connection		Nominal Flow Capacity (kW)							
				Block Core S24				Filter F24			
				R 134a	R 22	R 407C	R 507/ R 404A	R 134a	R 22	R 407C	R 507/ R 404A
FDS-245	003 573	16	5/8	22,3	30,6	28,5	26,0	24,7	33,9	31,5	28,8
FDS-247	003 574	22	7/8	32,2	44,1	41,0	37,5	37,8	51,8	48,2	44,0
FDS-249	003 575		1-1/8	46,0	63,0	58,6	53,6	50,7	69,4	64,5	59,0
FDS-249	003 576	28		44,2	60,5	56,3	51,4	48,6	66,6	61,9	56,6

Selection Chart Liquid Application

Type	Order-No.	Connection Solder/ODF		Nominal Flow Capacity (kW)									
				Pressure Drop 0.07 bar					Pressure Drop 0.14 bar				
				R 22	R 134a	R 507/ R 404A	R 407C	R 410A	R 22	R 134a	R 507/ R 404A	R 407C	R 410A
FDS-245	003 573	16	5/8"	75	68	49	71	74	98	90	64	93	97
FDS-247	003 574	22	7/8"	112	102	73	107	110	151	139	99	144	149
FDS-249	003 575		1-1/8"	113	104	74	108	112	160	147	104	153	158
FDS-249	003 576	28		114	104	74	108	112	163	150	106	156	161

Correction factors for other than the nominal conditions see page 100 ... 101.

Selection Chart Cores

Type	Order-No.	Water Capacity in Grams			Application	Acid Adsorption capacity (g)
		at a Liquid Temperature of 24°C (52°C)				
		R 134a	R 22	R 404A / R 507		
S24	003 504	35,2 (32,3)	34,8 (29,5)	35,4 (32,1)	Liquid and suction line	8.9
W24	003 505	12,5 (9,2)	12,3 (8,9)	13,5 (10,4)	For motor burn-out (Suction)	25.6
F24	003 506	- (-)	- (-)	- (-)	Filter for suction line	-

Cores have to be ordered separately. 1 piece needed for FDS24 shell.

Filter-Drier Shells With Quick-Cap, Series FDS-48

for Liquid Applications with Replaceable Cores

Features

- Quick-cap flange (one bolt) design makes replacing of cores in a matter of seconds
- Ideal for retrofit, reducing installation / material cost
- Ideal for refrigerant recovery / reclaim units with regular change of filter-drier
- Rigid core holder from steel (no plastic)
- Service friendly core holder and flange cover
- Optimum flow capacity at low pressure drop
- ODF Copper fittings for easy soldering
- Temperature range TS: -45°C to +65°C
- Max. working pressure PS:
 - 34,5 bar (-10°C to +65°C)
 - 25,9 bar (-45°C to -10°C)
- CE marking according PED 97/23 EC



FDS

Selection Chart

Type	Order-No.	Connection Solder/ODF mm inch	Nominal Flow Capacity (kW)										Number of Cores S48, H48 W48, F48
			Pressure Drop 0.07bar					Pressure Drop 0.14bar					
			R 22	R 134a	R 507/ R 404A	R 407C	R 410A	R 22	R 134a	R 507/ R 404A	R 407C	R 410A	
Conformity assessment cat. I, procedure module D1 (applied higher module as required)													
FDS 485	883 577	16 5/8"	78	72	51	75	77	100	92	65	95	99	1
FDS 487	883 578	22 7/8"	145	133	95	138	143	182	167	119	174	180	
FDS 489	883 579	1-1/8"	204	187	133	195	202	262	240	171	250	258	
FDS 4811	883 580	35 1-3/8"	285	261	186	272	281	355	325	231	338	350	

Correction factors for other than the nominal conditions see page 100 ... 101.

Selection Chart Cores

Type	Order-No.	Water adsorption capacity (gram)								Acid Adsorption Capacity (gram)
		Liquid Temperature 24°C				Liquid Temperature 52°C				
		R134a	R22	R404A/R507	R407C	R134a	R22	R404A/R507	R407C	
S48	003 508	79,7	74,7	82,3	56,7	73,0	66,7	75,9	48,9	16,3
H48	006 969	35,0	31,7	37,0	24,4	29,0	24,5	28,9	18,1	44,6
W48	006 970	24,7	22,1	26,2	17,1	19,9	16,4	19,5	12,1	39,7
F48	006 973	Filter								

Cores have to be ordered separately



Correction Tables for Liquid Line Filter Driers ADK, FDS and ADKS

Filter drier selection for operating conditions other than -15°C/+30°C:

Q_n : Nominal flow capacity
 Q_o : Required cooling capacity
 K_t : Correction factor for evaporating and liquid temperature

$$Q_n = Q_o \times K_t$$

Refrigerant	Liquid temperature °C	Correction factor K_t													
		Evaporating temperature °C													
		20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
R 134a	60	1,29	1,32	1,35	1,39	1,42	1,46	1,50	1,55	1,59	1,65	1,70			
	55	1,20	1,22	1,25	1,28	1,31	1,34	1,38	1,41	1,45	1,50	1,54			
	50	1,11	1,14	1,16	1,19	1,21	1,24	1,27	1,30	1,34	1,38	1,42			
	45	1,04	1,06	1,09	1,11	1,13	1,16	1,18	1,21	1,24	1,27	1,31			
	40	0,98	1,00	1,02	1,04	1,06	1,08	1,11	1,13	1,16	1,19	1,22			
	35	0,93	0,94	0,96	0,98	1,00	1,02	1,04	1,06	1,08	1,11	1,14			
	30	0,88	0,90	0,91	0,93	0,94	0,96	0,98	1,00	1,02	1,04	1,07			
	25	0,84	0,85	0,86	0,88	0,89	0,91	0,93	0,95	0,96	0,98	1,01			
	20		0,81	0,82	0,84	0,85	0,87	0,88	0,90	0,92	0,93	0,95			
	15			0,79	0,80	0,81	0,83	0,84	0,85	0,87	0,89	0,90			
	10				0,76	0,78	0,79	0,80	0,82	0,83	0,84	0,86			
	5					0,74	0,76	0,77	0,78	0,79	0,81	0,82			
	0						0,73	0,74	0,75	0,76	0,77	0,79			
	-5							0,71	0,72	0,73	0,74	0,75			
-10								0,69	0,70	0,71	0,72				
R 404A	60	1,77	1,83	1,90	1,97	2,06	2,16	2,27	2,39	2,54	2,70	2,89	3,12	3,39	3,70
	55	1,48	1,52	1,56	1,62	1,67	1,74	1,81	1,90	1,99	2,09	2,21	2,34	2,50	2,67
	50	1,28	1,31	1,34	1,38	1,43	1,47	1,53	1,59	1,65	1,73	1,81	1,90	2,00	2,11
	45	1,13	1,16	1,18	1,21	1,25	1,29	1,33	1,38	1,43	1,48	1,54	1,61	1,68	1,76
	40	1,02	1,04	1,06	1,09	1,12	1,15	1,18	1,22	1,26	1,30	1,35	1,40	1,46	1,52
	35	0,93	0,95	0,97	0,99	1,01	1,04	1,07	1,10	1,13	1,17	1,20	1,25	1,29	1,34
	30	0,86	0,87	0,89	0,91	0,93	0,95	0,97	1,00	1,03	1,06	1,09	1,12	1,16	1,20
	25	0,80	0,81	0,83	0,84	0,86	0,88	0,90	0,92	0,94	0,97	1,00	1,03	1,06	1,09
	20		0,76	0,77	0,79	0,80	0,82	0,84	0,85	0,87	0,90	0,92	0,95	0,97	1,00
	15			0,72	0,74	0,75	0,77	0,78	0,80	0,82	0,84	0,86	0,88	0,90	0,93
	10				0,69	0,71	0,72	0,73	0,75	0,77	0,78	0,80	0,82	0,84	0,86
	5					0,67	0,68	0,69	0,71	0,72	0,74	0,75	0,77	0,79	0,81
	0						0,65	0,66	0,67	0,68	0,70	0,71	0,73	0,74	0,76
	-5							0,63	0,64	0,65	0,66	0,67	0,69	0,70	0,72
	-10								0,61	0,62	0,63	0,64	0,65	0,67	0,68
	-15									0,59	0,60	0,61	0,62	0,64	0,65
-20										0,56	0,57	0,58	0,59	0,61	
R 507	60	1,68	1,73	1,78	1,84	1,91	1,99	2,07	2,17	2,27	2,39	2,53	2,69	2,87	3,08
	55	1,43	1,46	1,50	1,54	1,59	1,65	1,71	1,77	1,85	1,93	2,02	2,12	2,24	2,36
	50	1,25	1,28	1,31	1,34	1,38	1,42	1,47	1,52	1,57	1,63	1,70	1,77	1,85	1,94
	45	1,12	1,14	1,17	1,20	1,23	1,26	1,30	1,34	1,38	1,42	1,48	1,53	1,59	1,66
	40	1,02	1,04	1,06	1,08	1,11	1,13	1,16	1,20	1,23	1,27	1,31	1,36	1,40	1,46
	35	0,94	0,95	0,97	0,99	1,01	1,04	1,06	1,09	1,12	1,15	1,18	1,22	1,26	1,30
	30	0,87	0,88	0,90	0,92	0,94	0,96	0,98	1,00	1,02	1,05	1,08	1,11	1,14	1,18
	25	0,81	0,83	0,84	0,85	0,87	0,89	0,91	0,93	0,95	0,97	1,00	1,02	1,05	1,08
	20		0,77	0,79	0,80	0,81	0,83	0,85	0,86	0,88	0,90	0,92	0,95	0,97	1,00
	15			0,74	0,75	0,77	0,78	0,79	0,81	0,83	0,84	0,86	0,88	0,91	0,93
	10				0,71	0,72	0,74	0,75	0,76	0,78	0,79	0,81	0,83	0,85	0,87
	5					0,68	0,70	0,71	0,72	0,73	0,75	0,76	0,78	0,80	0,81
	0						0,66	0,67	0,68	0,70	0,71	0,72	0,74	0,75	0,77
	-5							0,64	0,65	0,66	0,67	0,68	0,70	0,71	0,73
	-10								0,62	0,63	0,64	0,65	0,66	0,68	0,69
	-15									0,60	0,61	0,62	0,63	0,64	0,65
-20										0,58	0,59	0,60	0,61	0,62	

Liquid temperatures are at bubble point.
 Evaporating temperatures are at dew point.

Refrigerant	Liquid temperature °C	Correction factor K_t Evaporating temperature °C													
		20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
R 22	60	1,28	1,29	1,30	1,32	1,34	1,36	1,38	1,40	1,42	1,45	1,48	1,51	1,54	1,57
	55	1,20	1,21	1,23	1,24	1,26	1,27	1,29	1,31	1,33	1,35	1,38	1,41	1,43	1,46
	50	1,13	1,14	1,16	1,17	1,18	1,20	1,22	1,23	1,25	1,27	1,29	1,32	1,34	1,37
	45	1,07	1,08	1,09	1,11	1,12	1,13	1,15	1,16	1,18	1,20	1,22	1,24	1,26	1,29
	40	1,02	1,03	1,04	1,05	1,06	1,08	1,09	1,10	1,12	1,14	1,15	1,17	1,19	1,21
	35	0,97	0,98	0,99	1,00	1,01	1,02	1,04	1,05	1,06	1,08	1,09	1,11	1,13	1,15
	30	0,93	0,94	0,95	0,96	0,97	0,98	0,99	1,00	1,01	1,03	1,04	1,06	1,07	1,09
	25	0,89	0,90	0,91	0,91	0,92	0,93	0,94	0,95	0,97	0,98	0,99	1,01	1,02	1,04
	20		0,86	0,87	0,88	0,88	0,89	0,90	0,91	0,93	0,94	0,95	0,96	0,98	0,99
	15			0,83	0,84	0,85	0,86	0,87	0,88	0,89	0,90	0,91	0,92	0,93	0,95
	10				0,81	0,82	0,82	0,83	0,84	0,85	0,86	0,87	0,88	0,89	0,91
	5					0,79	0,79	0,80	0,81	0,82	0,83	0,84	0,85	0,86	0,87
	0						0,76	0,77	0,78	0,79	0,80	0,81	0,82	0,83	0,84
	-5							0,74	0,75	0,76	0,77	0,78	0,79	0,80	0,81
	-10								0,73	0,73	0,74	0,75	0,76	0,77	0,78
-15									0,71	0,72	0,72	0,73	0,74	0,75	
-20										0,69	0,70	0,71	0,72	0,72	
R 407C	60	1,40	1,42	1,45	1,49	1,52	1,56	1,61	1,65	1,70	1,76	1,82			
	55	1,27	1,29	1,32	1,35	1,38	1,41	1,44	1,48	1,52	1,57	1,61			
	50	1,17	1,19	1,21	1,23	1,26	1,28	1,31	1,35	1,38	1,42	1,46			
	45	1,08	1,10	1,12	1,14	1,16	1,18	1,21	1,24	1,26	1,30	1,33			
	40	1,01	1,02	1,04	1,06	1,08	1,10	1,12	1,14	1,17	1,20	1,22			
	35	0,95	0,96	0,98	0,99	1,01	1,03	1,05	1,07	1,09	1,11	1,14			
	30	0,89	0,91	0,92	0,93	0,95	0,96	0,98	1,00	1,02	1,04	1,06			
	25	0,85	0,86	0,87	0,88	0,90	0,91	0,93	0,94	0,96	0,98	1,00			
	20		0,81	0,82	0,84	0,85	0,86	0,88	0,89	0,91	0,92	0,94			
	15			0,79	0,80	0,81	0,82	0,83	0,85	0,86	0,88	0,89			
	10				0,76	0,77	0,78	0,79	0,81	0,82	0,83	0,85			
	5					0,74	0,75	0,76	0,77	0,78	0,79	0,81			
	0						0,72	0,73	0,74	0,75	0,76	0,77			
	-5							0,70	0,71	0,72	0,73	0,74			
	-10								0,68	0,69	0,70	0,71			
R 410A*	60	1,62	1,64	1,66	1,68	1,70	1,73	1,76	1,80	1,83	1,87	1,92	1,96	2,02	2,07
	55	1,42	1,43	1,44	1,46	1,48	1,50	1,53	1,55	1,58	1,61	1,64	1,68	1,72	1,76
	50	1,27	1,28	1,29	1,31	1,32	1,34	1,36	1,38	1,40	1,43	1,45	1,48	1,51	1,55
	45	1,16	1,17	1,18	1,19	1,20	1,22	1,24	1,25	1,27	1,29	1,31	1,34	1,36	1,39
	40	1,07	1,08	1,09	1,10	1,11	1,12	1,14	1,15	1,17	1,18	1,20	1,22	1,24	1,27
	35	1,00	1,01	1,01	1,02	1,03	1,04	1,06	1,07	1,08	1,10	1,11	1,13	1,15	1,17
	30	0,94	0,94	0,95	0,96	0,97	0,98	0,99	1,00	1,01	1,03	1,04	1,06	1,07	1,09
	25	0,89	0,89	0,90	0,90	0,91	0,92	0,93	0,94	0,95	0,96	0,98	0,99	1,00	1,02
	20		0,84	0,85	0,86	0,86	0,87	0,88	0,89	0,90	0,91	0,92	0,93	0,95	0,96
	15			0,81	0,81	0,82	0,83	0,84	0,84	0,85	0,86	0,87	0,88	0,90	0,91
	10				0,78	0,78	0,79	0,80	0,80	0,81	0,82	0,83	0,84	0,85	0,86
	5					0,75	0,75	0,76	0,77	0,77	0,78	0,79	0,80	0,81	0,82
	0						0,72	0,73	0,73	0,74	0,75	0,76	0,76	0,77	0,78
	-5							0,70	0,70	0,71	0,72	0,72	0,73	0,74	0,75
	-10								0,68	0,68	0,69	0,69	0,70	0,71	0,72

Liquid temperatures are at bubble point.
Evaporating temperatures are at dew point.

* Do not exceed maximum operating pressure with R 410A:
ADK: 43.0 bar
ADKS / FDS (-10°C ... +65°C): 34.5 bar
ADKS / FDS (-45°C ... +10°C): 25.9 bar

Suction Line Filters and Filter Driers Series ASF and ASD

Hermetic design

Features

- Minimum pressure drop due to internal construction and compacted bead style
- Service friendly with 2 Schraeder valves for pressure drop measurement
- ODF Copper fittings for easy soldering
- Filtration down to 10 micron
- Temperature range TS: -45°C to +50°C
- Max. operating pressure PS: 27,5 bar
- No CE marking according art. 3.3 PED 97/23 EC
- HP marking according to German Pressorized Vessel Directive



ASF, ASD

Suction Line Filters

Type	Order- No.	Connection Solder/ODF		Nominal Capacity Q _n kW				
		mm	inch	R 134a	R 22	R 404A	R 407C	R507
ASF 28 S3	008 909		3/8	6,0	8,4	7,7	7,8	7,7
ASF 28 S4	008 910		1/2	9,9	14,4	13,4	13,4	13,4
ASF 35 S5	008 899		5/8	15,9	23,2	21,4	21,6	21,4
ASF 45 S6	008 925		3/4	23,3	34,5	32,0	32,1	32,0
ASF 45 S7	008 896	22	7/8	32,5	42,5	34,5	39,5	34,5
ASF 50 S9	008 881		1-1/8	46,0	67,1	55,5	62,4	55,5
ASF 75 S11	008 891	35	1-3/8	60,2	85,4	70,7	79,4	70,7
ASF 75 S13	008 953		1-5/8	65,4	87,5	73,1	81,4	73,1

Suction Line Filter Driers

Type	Order- No.	Connection Solder/ODF		Nominal Capacity Q _n (kW)				
		mm	inch	134a	R 22	R 404A	R 407C	R507
ASD 28 S3	008 965		3/8	5,5	8,1	7,4	7,5	7,4
ASD 28 S4	008 941		1/2	9,1	13,4	12,7	12,5	12,7
ASD 35 S5	008 915		5/8	14,3	20,4	19,0	19,0	19,0
ASD 45 S6	008 946		3/4	19,1	24,6	22,5	22,9	22,5
ASD 45 S7	008 904	22	7/8	25,0	32,3	26,4	30,0	26,4
ASD 50 S9	008 908		1-1/8	35,3	46,4	38,3	43,2	38,3
ASD 75 S11	008 919	35	1-3/8	42,9	56,9	47,8	52,9	47,8
ASD 75 S13	008 940		1-5/8	45,2	60,8	51,0	56,5	51,0

Nominal flow capacity at +4°C evaporating temperature (saturated condition/dew point) and a pressure drop of 0.21 bar between inlet and outlet of ASF/ASD. Correction factor for other evaporating temperatures than +4°C:

$$Q_n = Q_o \times K_s$$

- Q_n: Nominal capacity
 K_s: Correction factor for a pressure drop corresponding 1 K saturation temperature
 Q_o: Required cooling capacity

Evaporating Temperature (°C)	+4	0	-5	-10	-15	-20	-25	-30	-35	-40
Correction Factor K _s	1,00	1,12	1,35	1,75	2,00	2,50	3,00	3,75	5,00	6,60

Water and Acid Adsorption Capacity

Type	Water adsorption capacity (gram)										Acid Adsorption Capacity (g)
	Liquid Temperature 24°C					Liquid Temperature 52°C					
	R 134a	R 22	R 404A/R 507	R 407C	R 410A	R 134a	R 22	R 404A/R 507	R 407C	R 410A	
ASD28	11,8	5,7	12,2	9,1	8,0	10,0	3,6	9,7	6,7	5,6	3.0
ASD35	14,5	7,0	15,0	11,2	9,9	12,3	4,4	12,0	8,2	6,9	3.6
ASD45	18,0	8,8	18,6	13,9	12,3	15,3	5,5	14,9	10,2	8,6	4.5
ASD50	21,4	10,4	22,2	16,5	14,6	18,2	6,5	17,7	12,1	10,2	5.4
ASD75	31,5	15,4	32,6	24,3	21,5	26,7	9,6	26,0	17,8	15,0	7.9

Suction Line Filter and Filter Drier Shells Series BTAS

for Replaceable Filters and Filter Drier Cores

Features

- Corrosion resistant Brass body ideal for suction line applications
- Extremely large filtration area for optimum flow capacity
- Low pressure drop
- Filtration down to 10 micron
- Temperature range TS: -45°C ... +50°C
- Max. working pressure PS: 24 bar



Suction Line Shells With Filter Cores

Type	Order-No.	Connection Solder/ODF		Nominal Capacity Q _n kW					Filter Core	
		m m	inch	R 134a	R 22	R 404A	R 407C	R 507	Type	Order-No.
No CE marking according to art. 3.3 PED 97/23. HP marking according to German pressurised vessel directive										
BTAS 25	015 353		5/8	12,5	17,1	13,9	15,9	13,9	A2F	049 479
BTAS 27	015 354	22	7/8	22,3	29,6	24,3	27,5	24,3		
BTAS 39	015 355		1-1/8	37,7	50,4	40,6	46,9	40,6	A3F	049 480
BTAS 311	015 356	35	1-3/8	60,3	80,7	65,2	75,1	65,2		
BTAS 313	015 357		1-5/8	73,4	97,5	81,1	90,7	81,1		
BTAS 342	015 358	42		73,4	97,5	81,1	90,7	81,1		
BTAS 317	015 359	54	2-1/8	97,6	127,7	104,8	118,8	104,8	A4F	049 481
BTAS 417	015 360	54	2-1/8	134,7	178,2	145,3	165,7	145,3		
CE marked. Conformity assessment cat. I, procedure module A										
BTAS 521	015 361		2-5/8	209,0	282,4	229,8	262,6	229,8	A5F	049 482
BTAS 525	015 362		3-1/8	260,1	346,1	283,9	321,9	283,9		
BTAS 580	015 363	80		260,1	346,1	283,9	321,9	283,9		

Suction Line Shells With Filter Drier Cores

Type	Order-No.	Connection Solder/ODF		Nominal Capacity Q _n kW					Filter Drier Core	
		m m	inch	R 134a	R 22	R 404A	R 407C	R 507	Type	Order-No.
No CE marking according to art. 3.3 PED 97/23. HP marking according to German pressurised vessel directive										
BTAS 25	015 353		5/8	11,6	15,5	12,8	14,4	12,8	A2F- D	049 483
BTAS 27	015 354	22	7/8	19,1	25,2	20,6	23,4	20,6		
BTAS 39	015 355		1-1/8	34,4	45,7	37,5	42,5	37,5	A3F- D	049 484
BTAS 311	015 356	35	1-3/8	49,2	65,5	53,7	60,9	53,7		
BTAS 313	015 357		1-5/8	57,1	77,3	62,5	71,9	62,5		
BTAS 342	015 358	42		57,1	77,3	62,5	71,9	62,5		
BTAS 317	015 359	54	2-1/8	71,1	94,1	77,7	87,5	77,7	A4F- D	049 485
BTAS 417	015 360	54	2-1/8	106,8	144,5	118,3	134,4	118,3		
CE marked. Conformity assessment cat. I, procedure module A										
BTAS 521	015 361		2-5/8	153,3	205,1	169,0	190,7	169,0	A5F- D	049 486
BTAS 525	015 362		3-1/8	181,2	242,0	199,4	225,1	199,4		
BTAS 580	015 363	80		181,2	242,0	199,4	225,1	199,4		

Filters and Filter Drier cores have to be ordered separately.

Nominal capacity at +4°C evaporating temperature (saturated condition/dew point) and a pressure drop of 0.21 bar between inlet and outlet of BTAS. Correction factor for other evaporating temperatures than +4°C:

- Q_n: Nominal capacity
- K_s: Correction factor for a pressure drop corresponding 1K saturation temperature
- Q_o: Required cooling capacity

$$Q_n = Q_o \times K_s$$

Correction Factor K _s										
Evaporating Temperature (°C)										
	+4	0	-5	-10	-15	-20	-25	-30	-35	-40
K _s	1,00	1,12	1,35	1,75	2,00	2,50	3,00	3,75	5,00	6,60

BTAS - Water and Acid Adsorption Capacity

Core	Water adsorption capacity (grams)								Acid Adsorption (grams)
	Liquid Temperature 24°C				Liquid Temperature 52°C				
	R134a	R22	R404A/R 507	R407C	R134a	R22	R404A/R 507	R407C	
A2F-D	2.8	2.5	2.9	4.8	2.3	1.9	2.3	5.0	3.7
A3F-D	7.6	6.8	8.0	13.3	6.3	5.3	6.2	13.8	10.3
A4F-D	14.8	13.3	15.7	25.9	12.2	10.3	12.2	26.9	20.1
A5F-D	21.8	19.6	23.1	38.2	18.0	15.1	17.9	39.7	29.6

Moisture Liquid Indicators Series AMI



AMI-1 SS



AMI-1 MM



AMI-1 TT



AMI-2

Features

- First choice for R 134a, R 22, R 404A, R 507 and polyolester lubricants
- High accuracy of moisture indication
- Fused glass - no leakage
- Long lifetime of indicators by utilization of crystals
- Indicator with high resistance against acid and water
- Wide angle view for exact distinction of vapour and liquid
- Max. operating pressure PS: 31 bar



AMI-3

Water Contents* by Indicator Color

Refrigerant	Liquid Temperature °C	blue dry	violet	purple Caution	red Caution - wet
R 22	25	25	40	80	145
	38	35	65	130	205
	52	50	90	185	290
R 404A / R 507	25	15	33	60	120
	38	25	50	110	150
	52	45	60	140	180
R 134a	25	20	35	90	130
	38	35	55	120	160
	52	50	85	150	190
R 407C	25	26	42	94	151
	38	40	68	144	232
	52	64	109	230	371

*Water content in mg Water per kg refrigerant (ppm)



Selection Chart

Type	Order- No.	Connection		Configuration	
		m m	inch		
SS	SS 2 MM	805 732	6	Female Solder x Female Solder ODF x ODF	
	SS 2	805 713	1/4		
	SS 3 MM	805 733	10		
	SS 3	805 714	3/8		
	SS 4 MM	805 734	12		
	SS 4	805 715	1/2		
	SS 5	805 716	16		5/8
	SS 7	805 717	22		7/8
	SS 9 MM	805 703	28		
	SS 9	805 705	1-1/8		
AMI - 1 TT	TT 2 MM	805 697	6	Female Solder x Female Solder ODF x ODF (with extended Copper tubes)	
	TT 2	805 655	1/4		
	TT 3 MM	805 698	10		
	TT 3	805 654	3/8		
	TT 4 MM	805 699	12		
	TT 4	805 653	1/2		
	TT 5	805 652	16		5/8
	TT 7	805 656	22		7/8
	TT 9 MM	805 700	28		
	TT 9	805 651	1-1/8		
MM	MM 2	805 706	6	Male Flare x Male Flare	
	MM 3	805 707	10		3/8
	MM 4	805 708	12		1/2
	MM 5	805 709	16		5/8
	FM 2	805 710	6		1/4
FM	FM 3	805 711	10	Female Flare x Male Flare	
	FM 4	805 712	12		1/2
	S 11	805 704	35		1-3/8
AMI - 2 S	S 13	805 659	42	Male Solder ODM (for soldering into fittings)	
	S 17	805 687	54		2-1/8
	S 7	805 650	22		7/8
AMI - 3 S	S 9	805 649	28	Saddle Type (for soldering onto the pipe)	
	S 11	805 648	35		1-3/8

Accessories

	Type	Order No.
Lens Assembly Kit	X 12978-1	805 742
O-Ring	X 99995	805 643

Moisture Liquid Indicators Series MIA

Features

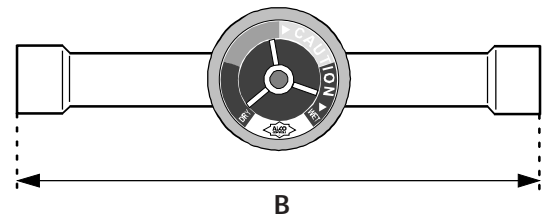
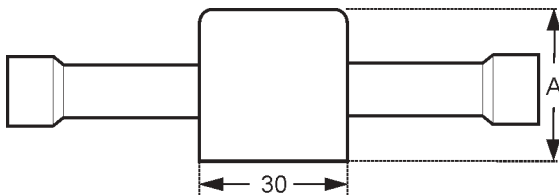
- Fully hermetic
- Corrosion free stainless steel body
- Crystal Indicator element for long lifetime and reliability
- Easy determination of moisture content
- Sensitive indicator with calibrated four colours
- Large clear viewing area
- Lightweight (only 60g MIA M06/014)
- ODF extended tube configurations suitable for all commercial applications
- For R 22, R 407C, R 134a, R 404A, R 507 and R 410A together with Mineral- and POE oils



MIA

Selection Chart

Type	Order-No.	for Tube Outside Ø	Height A (mm)	Length B (mm)	Weight (g)
MIA 014	805 851	1/4"	25,5	98,0	60
MIA 038	805 852	3/8"	35,5	109,0	80
MIA 012	805 853	1/2"	35,5	113,0	90
MIA 058	805 854	5/8"	35,5	108,5	95
MIA 078	805 864	7/8"	35,5	122,5	170
MIA M06	805 846	6 mm	25,5	98,0	60
MIA M10	805 847	10 mm	35,5	109,0	80
MIA M12	805 848	12 mm	35,5	113,0	90
MIA M16	805 854	16 mm	35,5	108,5	95



Water Contents* by Indicator Color

Refrigerant	Liquid Temperature °C	blue dry	violet	purple Caution	red Caution - wet
R 22	25	25	40	80	145
	38	35	65	130	205
	52	50	90	185	290
R 404A / R 507	25	15	33	60	120
	38	25	50	110	150
	52	45	60	140	180
R 134a	25	20	35	90	130
	38	35	55	120	160
	52	50	85	150	190
R 407C	25	26	42	94	151
	38	40	68	144	232
	52	64	109	230	371
R 410A	25	30	50	110	165
	38	55	85	190	290
	52	75	120	270	420

*Water content in mg Water per kg refrigerant (ppm)