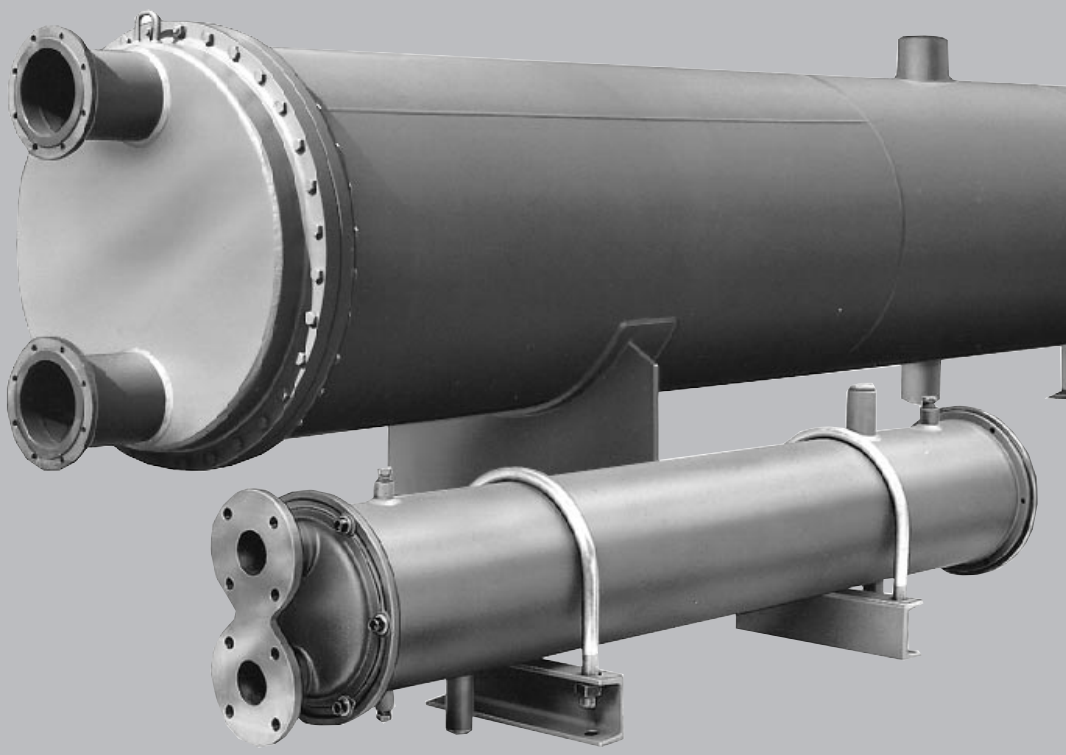
51.71
09-2000

- H(C)FC models HBX, HBXV, HC, HD and HE
- Ammonia condensers HBN and HN
- Selection programme available on request

Water Cooled Condensers

Models HBX, HBXV, HC, HD, HE, HBN and HN



HELPMAN

Water Cooled Condensers

Contents

* Nominal capacities at 10K lmtd

Combined Catalogue

This brochure is a collection of 7 separate product leaflets. Listed in this brochure are technical data and dimensions of the following water cooled condenser models:

H(C)FC	*Ammonia*
- HBX	- HBN
- HBX-V	- HN
- HC	
- HD	
- HE	

All capacity selection data have been left out. For capacity selection we now refer to our computer selection programme, which is available on request.

Individual product brochures are no longer available.

Water Cooled Condensers

Quality control

Strength

Strength calculations for the shell side do meet the requirements of AD Merkblätter .
The condensers are pressure tested refrigerant side at 30 bar.

Control on dehydration

The shell side is blown through with dry compressed air and dehydrated by evacuation. The vacuum dryness test is based on a stable pressure of 10 mbar maintained for 30 minutes.

Quality assurance

Quality assurance is based on ISO 9001.
Dimensions of the condensers are in accordance with the tolerance class of DIN 2800 8-E .
Factory certificates and production reports are available on request at an extra cost.

Construction and testing authorities

Condensers can be supplied in accordance with the rules of :

– Stoomwezen
– TÜV
– Det Norske Veritas
– Germanischer Lloyd
– Lloyd's R.o.S.
– Bureau Veritas
– A.B.o.S.

The above rules may require modification of construction details, therefore delivery on request only.

Operating Conditions

Unless otherwise indicated Helpman water cooled condensers are designed according to the following operating conditions.

	Operating temperature max. °C	min. °C	Operating pressure bar max. ≤14"	>14"
refr. side	+ 100	0	23	
water side	+ 50	1	4	2

Danger for freezing up (f.i. when blowing off refrigerant) to be avoided.

Application outside the above mentioned areas on request .

Enquiries

It is essential that the following details are given when ordering or making enquiries

– Type of refrigerant
– Duty kW
– Condensing temperature °C
– Water inlet temperature °C
– Water outlet temperature °C or waterflow m^3/h
– Fouling factor or type of water (sea water, river water etc.)
– Size of refrigerant connections and dimensions (if required).

Finish

Condensers are dehydrated on refrigerant side and provided with a charge of protection gas.
Outside of condenser is blasted (quality SA 2½) and finished with primer.

More information

For more information on the use of water cooled condensers we refer to our leaflet Nr. T-06-30-001 (General guidelines for the use of water cooled condensers).

Water Cooled Condensers HBN

Model indication

Example : HBN 16 - 335 - 2 pass

HBN	: Water cooled condenser with plain steel tubes, ø 19 mm
16	: Shell diameter code
335	: Effective length of the tube in cm (nominal length)
2	: Number of passes

General information

The HBN model water cooled condenser is suitable for ammonia as well as halocarbon refrigerants.

There are 11 shell diameters available in 3 standard lengths.

Capacity range of 23 up to 1563 kW at 10 K lmtd and refrigerant NH_3

Design

The condensers are built up of :

– shell : seamless steel

– tube plates : P265 GH acc. to EN 10028-2

– tubes : seamless steel ø19 mm tubes rolled into tube plates

– end covers: cast iron

– water connections without counter flanges

For construction and testing autorities see page 3.

Operating Conditions

Refrigerant side :		23 bar
Water side :	HBN 6-14	4 bar
	HBN 16-22	2 bar

Optional extra's

The condensers are available with various accessories, that can be indicated in your order with following codes.

V	Connection stub ø26,9 for safety valve (reduced from ø42,2)
K	Valves on return cover
F	Steel counter flanges to DIN 2631
S	Mounting feet
G	Header as gas distribution header on inlet side or as liquid collection header on outlet side
A	Drain connection with valve TAH-8 on shell
O	Purge connection on shell ø21,3
Z	Oilpot with drain valve TAH 8
P	Coating on water side

Water Cooled Condensers HBN

Max. Waterflow (m^3/h)

Type	Number of passes 2 pass.	4 pass.
HBN 6	10.4	5.2
HBN 7	15.6	7.8
HBN 8	26.1	13.0
HBN 10	44.3	22.1
HBN 12	54.7	27.3
HBN 13	67.8	33.9
HBN 14	93.8	46.9
HBN 16	125.1	62.5
HBN 18	151.1	75.6
HBN 20	192.8	96.4
HBN 22	237.1	118.6

Nominal duty

Type	Nominal duty (kW) uncoated	coated
HBN 6 - 220	33.0	23.3
HBN 7 - 220	49.5	35.0
HBN 8 - 220	82.8	58.4
HBN 10 - 220	140.5	99.3
HBN 12 - 335	266.0	187.7
HBN 13 - 335	330.0	232.4
HBN 14 - 335	456.5	321.8
HBN 16 - 450	824.0	579.9
HBN 18 - 450	996.0	700.6
HBN 20 - 450	1271.0	893.9
HBN 22 - 450	1563.0	1099.0

The nominal duty is based on following conditions :

refrigerant NH_3

Maximum waterflow

fouling factor :
uncoated $1.72 \times 10^{-4} m^2K/W$
coated $0.86 \times 10^{-4} m^2K/W$

lmtd : 10 K

Technical data

Type	Number of tubes	Surface m^2 L_{nom} (cm)			Pump down capacity * L_{nom} (cm)			Internal water capacity dm^3 L_{nom} (cm)			Weight kg L_{nom} (cm)		
		220	335	450	220	335	450	220	335	450	220	335	450
HBN- 6	16	2.1	3.2	4.3	11	16	22	8	12	16	85	120	150
HBN- 7	24	3.2	4.8	6.4	16	25	34	12	18	24	110	160	210
HBN- 8	40	5.3	8.0	10.7	28	42	56	20	30	40	170	240	310
HBN-10	68	8.9	13.6	18.3	46	70	95	35	50	65	250	350	460
HBN-12	84	11.0	16.8	22.6	57	87	117	40	60	80	310	440	570
HBN-13	104	13.7	20.8	27.9	70	107	144	50	75	100	360	520	670
HBN-14	144	18.9	28.8	38.7	97	147	198	70	110	140	480	680	900
HBN-16	192	25.2	38.4	51.6	130	198	266	95	140	180	650	950	1200
HBN-18	232	30.5	46.4	62.3	156	237	320	110	170	220	800	1100	1450
HBN-20	296	38.9	59.2	79.5	200	305	410	140	210	280	1000	1400	1800
HBN-22	364	47.8	72.8	97.8	246	375	505	170	260	340	1200	1750	2250

* Pump down capacity (dm^3/m).
Pump down capacities are based on 70 % of the tubes below the liquid level.

Water Cooled Condensers **HBN**

Dimensions

Type	Dimensions mm																	
			2 passes				4 passes					Oil pot		Supports				
	d	D	A	B	E	F	A	B	C	E	F	K	M	H	H*	G	P	
HBN- 6	159	204	30	85	123	32	30	75	32	103	25	115	114	160	205	140	14	
HBN- 7	168	223	35	90	133	40	35	90	32	123	32	120	114	170	220	140	14	
HBN- 8	219	266	40	100	143	50	40	100	40	133	40	125	114	190	245	140	14	
HBN-10	267	316	50	105	163	65	50	105	50	143	50	125	133	215	270	240	18	
HBN-12	298	353	50	120	193	80	50	115	60	163	65	125	168	230	285	240	18	
HBN-13	324	379	60	120	193	80	60	115	60	163	65	125	168	245	300	240	18	
HBN-14	368	423	65	135	213	100	65	135	70	193	80	130	168	265	325	240	18	
HBN-16	419	481	75	140	243	125	75	140	75	193	80	120	219	290	340	340	23	
HBN-18	457	521	80	145	243	125	80	145	85	213	100	125	219	310	365	340	23	
HBN-20	508	578	90	160	268	150	90	160	98	213	100	125	219	335	390	340	23	
HBN-22	559	631	180	255	268	150	100	170	110	243	125	130	219	360	420	390	23	

* With oilpot

Dimensions **X** and **Y**, and the size of the refrigerant connections to be given with order.