Commercial Compressors

Selection & Application guidelines

Blue star

CONDENSING UNITS

60 Hz

R22
R134a
R404A
R507

1 CYLINDER

2 CYLINDERS

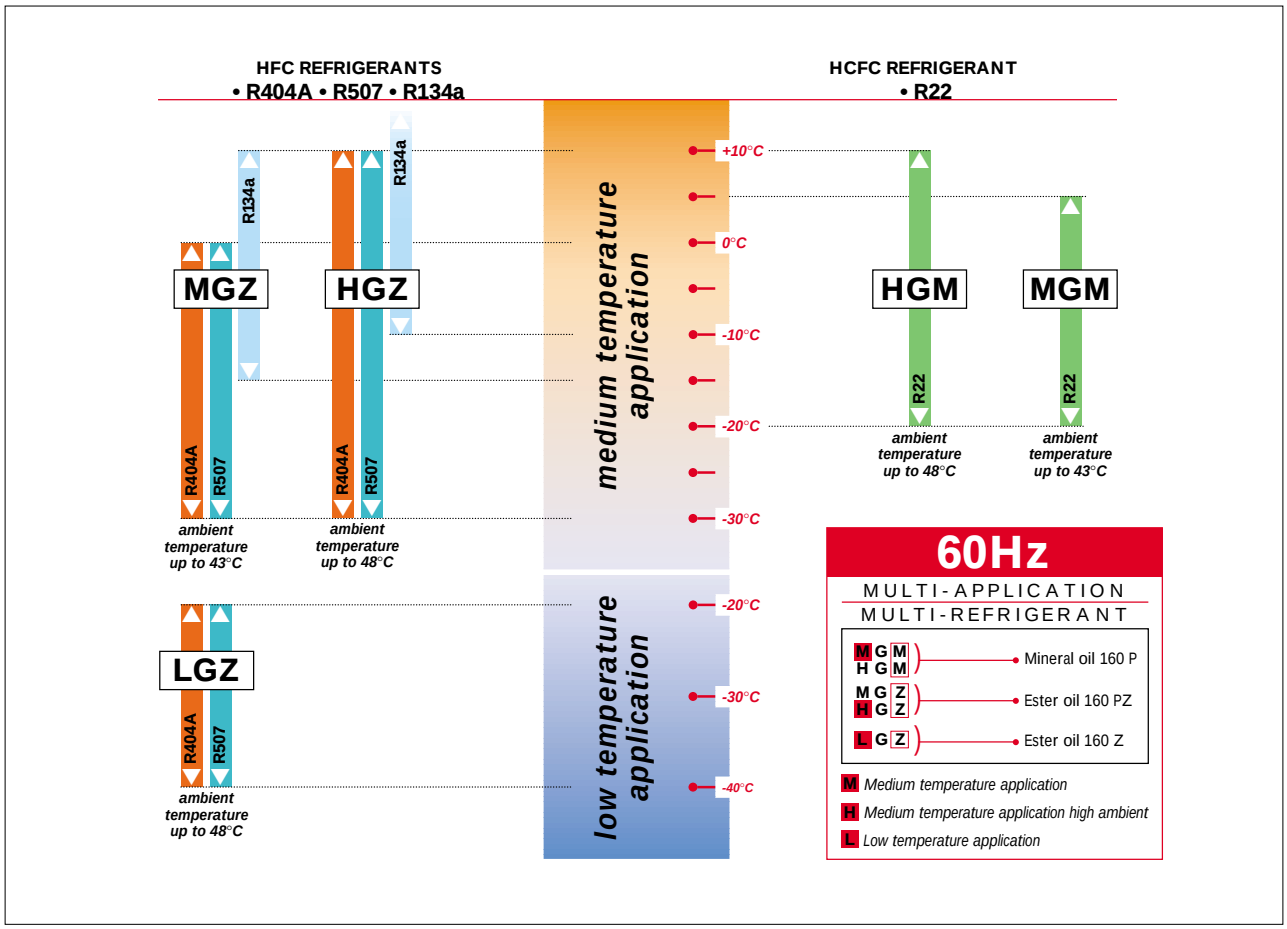
4 CYLINDERS

Expect more from us

Danfoss Maneurop

60 Hz Bluestar product program

PRODUCT RANGE



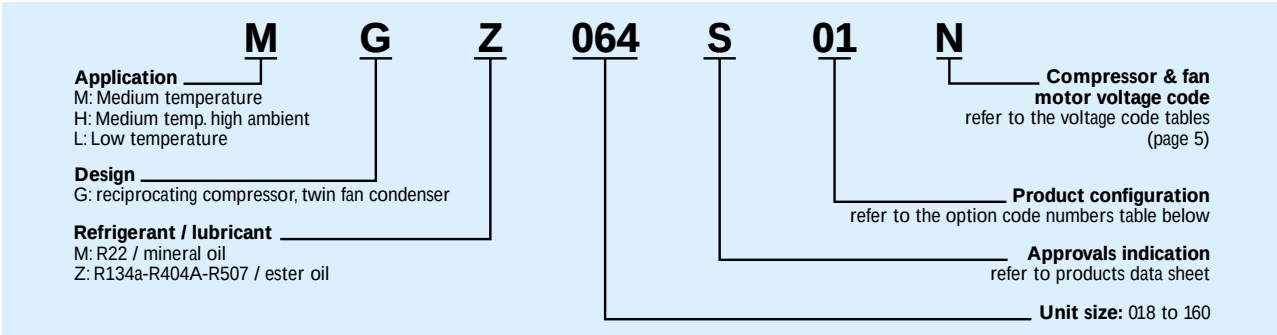
STANDARD PRODUCT DESCRIPTION

The multi-purpose series of Bluestar condensing units include as standard:

- Hermetic compressors for R22 or R134a / R404A / R507 refrigerants, fitted with screw type sight glass, suction and discharge valves, built-in protections: pressure, temperature, current.
- Crankcase heater (auto regulated PTC, 35 W), or trickle circuit for small size single phase compressors in R22 version.
- Compressor oil charge, 160P for R22 version and 160PZ (MGZ-HGZ), 160Z (LGZ) for HFC version.
- High efficiency condensers (2 fans, rifled tubes and louvre fins).
- 33 bar maxi operating pressure liquid receiver (except 3,1 litre receivers R22 models M.O.P. 25 bar) with welded shut-off valve.
- Factory fitted suction and liquid stubs for brazed connections.
- Prewired electrical boxes.
- Danfoss HP/LP safety switch.
- Reinforced base frame.
- All components epoxy powder coated.
- Dry holding charge.

60 Hz Bluestar product program

MODELS DESIGNATION (10 DIGITS)



BLUESTAR PHILOSOPHY

Danfoss Maneurop condensing units have evolved over the years to meet present and future requirements of performance, sound level, compactness, construction quality, and conformity with ecological standards.
Today, a successful conception and production means compliance with not only the specifics of the application but also the regional market regulation and standards.
For theses reasons, Danfoss Maneurop has made possible a global product development in an effort to harmonise the various regional standards, thus offering design synergies through a wide programme of condensing units.
The "G" ranges of Bluestar include a Maneurop® compressor and a multifan condenser. These units could be used for both low (L) and medium (M normal ambient, H high ambient) temperature applications.
Based on this product design, two imperative criterias must be considered:

- **The product configuration**
- **The approvals indication**

By referring to theses codes and letter it becomes easy to establish if the product complies to both technical and regulation requirements.

PRODUCT CONFIGURATION

This information is given by a 2 digit option code number which defines the construction variations applied to standard models.
The main construction variations applicable on standard products are listed below. Other options may be developed according to your requirement, please contact your Danfoss Maneurop Sales Organisation.

Option code numbers table

Option Code	Product configuration	Receiver	Standard electrical wiring	Safety pressure switch	Comp. suct./disch. valves	Base frame Compressor Condenser
00	universal design	Yes	Yes	Yes	Yes	Refer to the STANDARD PRODUCT DESCRIPTION
01	without electrical box, without HP/LP safety switch	Yes	No	No	Yes	
02	without receiver	No	Yes	Yes	Yes	
03	without elec. box, without HP/LP switch, without receiver	No	No	No	Yes	
04	without HP/LP safety switch	Yes	Yes	No	Yes	
05	without receiver, without HP/LP safety switch	No	Yes	No	Yes	
06	without elec. box, pressure switch, receiver and valves	No	No	No	No	

APPROVALS INDICATION

This information is given by a letter which informs about the condensing unit components conformity to the main or specific regulations inside a region.
To determine the precise product description of special models and the corresponding approvals, please refer to the Bluestar Data Sheets.

VOLTAGE CODE TABLES

Voltage		MGM / MGZ												
Description	**Code**	**018**	**022**	**028**	**032**	**036**	**040**	**050**	**064**	**080**	**100**	**125**	**144**	**160**
Comp. 230 V - 1 Ph. Fan 230 V - 1 Ph.	**N**	▬	▬	▬	▬	▬	▬	▬	▬					
Comp. 230 V - 3 Ph. Fan 230 V - 3 Ph.	**P**			*	*	*	*	*	*	▬	▬	▬	▬	▬
Comp. 230 V - 3 Ph. Fan 230 V - 1 Ph.	**Q**	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
Comp. 380 V - 3 Ph. Fan 380 V - 3 Ph.	**U**							*	*	*	*	*	*	*
Comp. 380 V - 3 Ph. Fan 230 V - 1 Ph.	**V**	- - -	- - -	- - -	- - -	- - -	- - -	▬	▬	▬	▬	▬	▬	▬

Voltage		HGM / HGZ												
Description	**Code**	**018**	**022**	**028**	**032**	**036**	**040**	**050**	**064**	**080**	**100**	**125**	**144**	**160**
Comp. 230 V - 1 Ph. Fan 230 V - 1 Ph.	**N**	▬	▬	▬	▬	▬	▬	▬	▬					
Comp. 230 V - 3 Ph. Fan 230 V - 3 Ph.	**P**		*	*	*	*	*	*	*	▬	▬	▬	▬	▬
Comp. 230 V - 3 Ph. Fan 230 V - 1 Ph.	**Q**	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
Comp. 380 V - 3 Ph. Fan 380 V - 3 Ph.	**U**							*	*	*	*	*	*	*
Comp. 380 V - 3 Ph. Fan 230 V - 1 Ph.	**V**	- - -	- - -	- - -	- - -	- - -	- - -	▬	▬	▬	▬	▬	▬	▬

Voltage		LGZ					
Description	**Code**	**022**	**028**	**044**	**050**	**088**	**100**
Comp. 230 V - 1 Ph. Fan 230 V - 1 Ph.	**N**	▬	▬	▬	▬		
Comp. 230 V - 3 Ph. Fan 230 V - 3 Ph.	**P**		*	*	*	▬	▬
Comp. 230 V - 3 Ph. Fan 230 V - 1 Ph.	**Q**	▬	▬	▬	▬	▬	▬
Comp. 380 V - 3 Ph. Fan 380 V - 3 Ph.	**U**		*	*	*	▬	▬
Comp. 380 V - 3 Ph. Fan 230 V - 1 Ph.	**V**	▬	▬	▬	▬	▬	▬

***** Please contact your local Danfoss sales organisation to confirm product availability.
- - - - Compressor availability only under certain conditions, please contact your local sales organisation.

General specifications

Models	Weight (kg)	Compressor			Condenser				
		Type	Swept volume (m3/h)	Oil charge (dm3)	Air Flow (m3/h)	Coil		Fans	
						Type	Intern. vol. (dm3)	Number (Nb)	Fan blade (mm)
MGM / MGZ 018	47	**MT / MTZ 18**	5.26	0.95	1600	B3	1.1	2	254
MGM / MGZ 022	49	**MT / MTZ 22**	6.58	0.95	1400	C3	1.7	2	254
MGM / MGZ 028	61	**MT / MTZ 28**	8.29	0.95	3250	D3	1.5	2	300
MGM / MGZ 032	63	**MT / MTZ 32**	9.3	0.95	3000	E3	2.2	2	300
MGM / MGZ 036	64	**MT / MTZ 36**	10.6	0.95	3000	E3	2.2	2	300
MGM / MGZ 040	66	**MT / MTZ 40**	12	0.95	2600	F3	2.9	2	300
MGM / MGZ 050	89	**MT / MTZ 50**	14.8	1.8	5650	G3	2.3	2	355
MGM / MGZ 064	98	**MT / MTZ 64**	18.6	1.8	4650	H3	4.7	2	355
MGM / MGZ 080	121	**MT / MTZ 80**	23.7	1.8	9000	L3	5.1	2	450
MGM / MGZ 100	143	**MT / MTZ 100**	29.8	3.9	9000	L3	5.1	2	450
MGM / MGZ 125	155	**MT / MTZ 125**	37.6	3.9	8600	M3	6.8	2	450
MGM / MGZ 144	158	**MT / MTZ 144**	42	3.9	8200	N3	8.5	2	450
MGM / MGZ 160	166	**MT / MTZ 160**	47.25	3.9	8200	N3	8.5	2	450
HGM / HGZ 018	50	**MT / MTZ 18**	5.26	0.95	1400	C3	1.7	2	254
HGM / HGZ 022	59	**MT / MTZ 22**	6.58	0.95	3250	D3	1.5	2	300
HGM / HGZ 028	61	**MT / MTZ 28**	8.29	0.95	3000	E3	2.2	2	300
HGM / HGZ 032	84	**MT / MTZ 32**	9.3	0.95	5650	G3	2.3	2	355
HGM / HGZ 036	85	**MT / MTZ 36**	10.6	0.95	5650	G3	2.3	2	355
HGM / HGZ 040	85	**MT / MTZ 40**	12	0.95	4650	H3	4.7	2	355
HGM / HGZ 050	96	**MT / MTZ 50**	14.8	1.8	4650	H3	4.7	2	355
HGM / HGZ 064	116	**MT / MTZ 64**	18.6	1.8	9000	L3	5.1	2	450
HGM / HGZ 080	124	**MT / MTZ 80**	23.7	1.8	8600	M3	6.8	2	450
HGM / HGZ 100	156	**MT / MTZ 100**	29.8	3.9	8200	N3	8.5	2	450
HGM / HGZ 125	218	**MT / MTZ 125**	37.6	3.9	15250	P3	9.7	2	600
HGM / HGZ 144	221	**MT / MTZ 144**	42	3.9	15250	P3	9.7	2	600
HGM / HGZ 160	224	**MT / MTZ 160**	47.25	3.9	13500	Q3	13	2	600
LGZ 022	51	**LTZ 22**	8.3	0.95	1400	C3	1.7	2	254
LGZ 028	57	**LTZ 28**	12	0.95	3250	D3	1.5	2	300
LGZ 044	89	**LTZ 44**	18.6	1.8	5650	G3	2.3	2	355
LGZ 050	96	**LTZ 50**	23.7	1.8	4650	H3	4.7	2	355
LGZ 088	141	**LTZ 88**	37.6	3.9	9000	L3	5.1	2	450
LGZ 100	144	**LTZ 100**	47.25	3.9	9000	L3	5.1	2	450

General specifications

Liquid receiver			Connections					Models
			Condenser		Lines			
Internal volume (dm3)	Height (mm)	External Diameter (mm)	Inlet (" / mm)	Outlet (" / mm)	Suction (" / mm)	Discharge (" / mm)	Liquid (" / mm)	
3.1	252	130	3/8 / 10	3/8 / 10	1/2 / 12	3/8 / 10	3/8 / 10	**MGM / MGZ 018**
3.1	252	130	3/8 / 10	3/8 / 10	1/2 / 12	3/8 / 10	3/8 / 10	**MGM / MGZ 022**
6	291	170	1/2 / 12	*1/2 / 12	1/2 / 12	1/2 / 12	1/2 / 12	**MGM / MGZ 028**
6	291	170	1/2 / 12	1/2 / 12	5/8 / 16	1/2 / 12	1/2 / 12	**MGM / MGZ 032**
6	291	170	1/2 / 12	1/2 / 12	5/8 / 16	1/2 / 12	1/2 / 12	**MGM / MGZ 036**
6	291	170	1/2 / 12	1/2 / 12	5/8 / 16	1/2 / 12	1/2 / 12	**MGM / MGZ 040**
7.5	384	170	5/8 / 16	1/2 / 12	7/8 / 22	5/8 / 16	1/2 / 12	**MGM / MGZ 050**
10	350	220	5/8 / 16	1/2 / 12	7/8 / 22	5/8 / 16	1/2 / 12	**MGM / MGZ 064**
10	350	220	5/8 / 16	1/2 / 12	1" 1/8 / 28	5/8 / 16	1/2 / 12	**MGM / MGZ 080**
10	350	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	3/4 / 19	1/2 / 12	**MGM / MGZ 100**
14	455	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	3/4 / 19	5/8 / 16	**MGM / MGZ 125**
14	455	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	3/4 / 19	5/8 / 16	**MGM / MGZ 144**
14	455	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	3/4 / 19	5/8 / 16	**MGM / MGZ 160**
3.1	252	130	3/8 / 10	3/8 / 10	1/2 / 12	3/8 / 10	3/8 / 10	**HGM / HGZ 018**
6	291	170	1/2 / 12	1/2 / 12	1/2 / 12	1/2 / 12	1/2 / 12	**HGM / HGZ 022**
6	291	170	1/2 / 12	*1/2 / 12	1/2 / 12	1/2 / 12	1/2 / 12	**HGM / HGZ 028**
7.5	384	170	5/8 / 16	1/2 / 12	5/8 / 16	5/8 / 16	1/2 / 12	**HGM / HGZ 032**
7.5	384	170	5/8 / 16	1/2 / 12	5/8 / 16	5/8 / 16	1/2 / 12	**HGM / HGZ 036**
7.5	384	170	5/8 / 16	1/2 / 12	5/8 / 16	5/8 / 16	1/2 / 12	**HGM / HGZ 040**
7.5	384	170	5/8 / 16	1/2 / 12	7/8 / 22	5/8 / 16	1/2 / 12	**HGM / HGZ 050**
10	350	220	3/4 / 19	5/8 / 16	7/8 / 22	3/4 / 19	1/2 / 12	**HGM / HGZ 064**
14	455	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	3/4 / 19	5/8 / 16	**HGM / HGZ 080**
14	455	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	3/4 / 19	5/8 / 16	**HGM / HGZ 100**
14	455	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	7/8 / 22	5/8 / 16	**HGM / HGZ 125**
14	455	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	7/8 / 22	5/8 / 16	**HGM / HGZ 144**
14	455	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	7/8 / 22	5/8 / 16	**HGM / HGZ 160**
3.1	252	130	3/8 / 10	3/8 / 10	5/8 / 16	3/8 / 10	3/8 / 10	**LGZ 022**
3.1	252	130	1/2 / 12	1/2 / 12	5/8 / 16	1/2 / 12	3/8 / 10	**LGZ 028**
7.5	384	220	5/8 / 16	1/2 / 12	7/8 / 22	5/8 / 16	1/2 / 12	**LGZ 044**
7.5	384	220	5/8 / 16	1/2 / 12	7/8 / 22	5/8 / 16	1/2 / 12	**LGZ 050**
10	350	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	3/4 / 19	1/2 / 12	**LGZ 088**
10	350	220	3/4 / 19	5/8 / 16	1" 1/8 / 28	3/4 / 19	1/2 / 12	**LGZ 100**

* 5/8"/16 on 230V/1Ph/60 Hz models.

Performance data
60 Hz

MGM

R22

Models	TE	+ 5°C		0°C		- 5°C		- 10°C		- 15°C		- 20°C	
	TA	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.
MGM 018	27	4378	1.6	3606	1.4	2901	1.3	2269	1.2	1715	1.0	1238	0.9
	32	4022	1.7	3310	1.5	2661	1.3	2080	1.2	1571	1.0	1135	0.9
	38	3611	1.8	2963	1.6	2375	1.4	1851	1.2	1394	1.1	1006	0.9
	43	-	-	2672	1.6	2138	1.5	1663	1.3	1251	1.1	903	0.9
MGM 022	27	5674	2.2	4791	2.0	3960	1.7	3186	1.5	2477	1.3	1835	1.1
	32	5223	2.3	4399	2.0	3622	1.8	2897	1.6	2230	1.3	1626	1.1
	38	-	-	3947	2.1	3226	1.8	2551	1.6	1931	1.4	1369	1.1
	43	-	-	-	-	2893	1.9	2265	1.6	1686	1.4	1161	1.1
MGM 028	27	8048	2.9	6870	2.6	5763	2.4	4736	2.1	3793	1.9	2937	1.7
	32	7519	3.1	6406	2.7	5357	2.5	4380	2.2	3482	1.9	2664	1.7
	38	-	-	5863	2.9	4875	2.6	3953	2.3	3103	2.0	2329	1.7
	43	-	-	-	-	4469	2.6	3598	2.3	2792	2.0	2057	1.7
MGM 032	27	9121	3.3	7697	3.0	6383	2.7	5183	2.5	4101	2.2	3137	2.0
	32	8532	3.5	7191	3.1	5951	2.8	4817	2.5	3793	2.3	2880	2.0
	38	7841	3.7	6590	3.3	5433	3.0	4373	2.6	3416	2.3	2563	2.0
	43	-	-	6083	3.4	5001	3.1	4007	2.7	3109	2.4	2307	2.0
MGM 036	27	10122	3.8	8694	3.4	7344	3.1	6084	2.8	4919	2.5	3856	2.2
	32	9464	4.0	8109	3.6	6825	3.2	5623	2.9	4509	2.6	3491	2.2
	38	-	-	7422	3.8	6208	3.4	5069	3.0	4012	2.7	3043	2.3
	43	-	-	-	-	5688	3.5	4608	3.1	3603	2.7	2680	2.4
MGM 040	27	11211	4.4	9536	4.0	7989	3.5	6577	3.2	5297	2.8	4149	2.4
	32	10590	4.7	8969	4.2	7469	3.7	6098	3.3	4854	2.8	3737	2.5
	38	-	-	8301	4.4	6851	3.9	5524	3.4	4318	2.9	3234	2.5
	43	-	-	-	-	6333	4.0	5049	3.5	3880	3.0	2827	2.6
MGM 050	27	13258	4.9	11116	4.4	9189	3.9	7483	3.4	6000	3.0	4735	2.6
	32	12387	5.1	10356	4.6	8531	4.1	6916	3.6	5516	3.1	4324	2.7
	38	-	-	9453	4.8	7741	4.2	6231	3.7	4925	3.3	3819	2.8
	43	-	-	-	-	7080	4.4	5664	3.9	4442	3.4	3409	2.9
MGM 064	27	17638	6.3	14868	5.6	12300	5.1	9952	4.5	7835	4.0	5953	3.4
	32	16531	6.6	13931	5.9	11519	5.3	9312	4.7	7320	4.1	5549	3.5
	38	15193	7.0	12797	6.3	10571	5.5	8532	4.9	6692	4.2	5055	3.6
	43	-	-	11859	6.5	9789	5.8	7890	5.0	6177	4.4	4651	3.7
MGM 080	27	22551	7.7	19073	6.9	15820	6.2	12817	5.5	10076	4.8	7607	4.2
	32	21165	7.2	17907	7.3	14858	6.6	12037	5.8	9461	5.1	7138	4.5
	38	19523	8.1	16514	7.8	13695	7.0	11087	6.2	8704	5.5	6555	4.8
	43	18124	8.7	15342	8.2	12729	7.4	10307	6.6	8090	5.8	6087	5.1
MGM 100	27	25933	9.0	21879	8.2	18134	7.5	14728	6.8	11672	6.1	8974	5.5
	32	24103	9.5	20316	8.6	16814	7.8	13626	7.0	10764	6.3	8238	5.5
	38	21961	10.0	18465	9.1	15233	8.1	12292	7.3	9655	6.4	7331	5.6
	43	-	-	-	-	13908	8.4	11190	7.5	8751	6.6	6600	5.7
MGM 125	27	32505	12.2	27747	11.0	23287	9.9	19158	8.9	15395	8.0	12024	7.1
	32	30095	12.9	25702	11.6	21577	10.4	17749	9.3	14256	8.2	11123	7.3
	38	-	-	23345	12.2	19576	10.8	16078	9.6	12887	8.5	10027	7.5
	43	-	-	-	-	17890	11.3	14686	10.0	11759	8.8	9133	7.7
MGM 144	27	35445	14.0	30433	12.6	25675	11.3	21238	10.1	17173	9.1	13514	8.1
	32	32693	14.7	28091	13.2	23711	11.8	19617	10.5	15862	9.3	12479	8.2
	38	-	-	25366	13.8	21398	12.3	17688	10.9	14285	9.6	11221	8.5
	43	-	-	-	-	-	-	16071	11.3	12973	9.9	10183	8.6
MGM 160	27	37803	16.2	32579	14.4	27592	12.9	22920	11.5	18626	10.3	14752	9.1
	32	-	-	30081	15.1	25490	13.4	21178	11.9	17207	10.5	13621	9.3
	38	-	-	-	-	23031	14.0	19116	12.4	15509	10.9	12254	9.5
	43	-	-	-	-	-	-	17379	12.7	14091	11.2	11121	9.7

LEGEND

P.F. cooling capacity (W)
P.A. power input (kW)

TE evaporating temperature (°C)
TA ambient temperature (°C)

PERFORMANCE DATA ARE BASED ON

- 60 Hz • Superheat 18 K
- Subcooling 3 K

Performance data
60 Hz

HGM

R22

Models	TE	+ 10°C		+ 5°C		0°C		- 5°C		- 10°C		- 15°C		- 20°C	
	TA	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.
HGM 018	32	4996	1.8	4176	1.6	3422	1.5	2739	1.3	2132	1.2	1604	1.0	1154	0.9
	38	4502	1.9	3753	1.7	3066	1.6	2447	1.4	1899	1.2	1425	1.1	1024	0.9
	43	-	-	-	-	2770	1.6	2207	1.4	1709	1.3	1280	1.1	920	0.9
	48	-	-	-	-	-	-	1982	1.5	1532	1.3	1146	1.1	823	0.9
HGM 022	32	7031	2.3	5949	2.1	4943	1.9	4018	1.7	3177	1.5	2422	1.3	1751	1.1
	38	6412	2.5	5402	2.2	4462	2.0	3599	1.8	2814	1.6	2108	1.3	1482	1.1
	43	-	-	4941	2.3	4063	2.1	3255	1.8	2518	1.6	1856	1.4	1268	1.1
	48	-	-	-	-	-	-	2906	1.9	2222	1.6	1605	1.4	1056	1.1
HGM 028	32	9339	3.1	8027	2.9	6797	2.6	5654	2.4	4602	2.2	3644	1.9	2781	1.7
	38	8622	3.4	7390	3.1	6233	2.8	5154	2.5	4160	2.2	3253	2.0	2436	1.7
	43	-	-	-	-	5759	2.9	4740	2.6	3797	2.3	2936	2.0	2158	1.7
	48	-	-	-	-	-	-	-	-	3433	2.3	2619	2.0	1881	1.7
HGM 032	32	10720	3.6	9109	3.3	7624	3.0	6269	2.8	5046	2.5	3954	2.2	2991	2.0
	38	9914	3.8	8405	3.5	7012	3.2	5742	2.9	4595	2.6	3572	2.3	2669	2.0
	43	-	-	7815	3.7	6505	3.3	5309	3.0	4228	2.7	3262	2.3	2411	2.0
	48	-	-	-	-	-	-	4870	3.1	3857	2.7	2952	2.4	2152	2.1
HGM 036	32	11783	4.2	10182	3.8	8671	3.5	7258	3.1	5953	2.8	4757	2.5	3674	2.2
	38	10917	4.5	9401	4.0	7969	3.7	6629	3.3	5388	2.9	4250	2.6	3217	2.3
	43	-	-	-	-	7384	3.8	6108	3.4	4925	3.0	3837	2.7	2849	2.4
	48	-	-	-	-	-	-	-	-	4456	3.1	3422	2.8	2480	2.4
HGM 040	32	13927	4.4	11874	4.1	9993	3.8	8279	3.5	6733	3.1	5345	2.8	4110	2.4
	38	13103	4.8	11117	4.4	9295	4.0	7634	3.7	6134	3.3	4787	2.9	3587	2.5
	43	12421	5.2	10492	4.7	8721	4.3	7104	3.8	5643	3.4	4330	2.9	3159	2.5
	48	-	-	-	-	8142	4.5	6573	4.0	5153	3.5	3876	3.0	2737	2.6
HGM 050	32	16271	5.3	13646	4.8	11295	4.3	9219	3.9	7411	3.5	5866	3.0	4567	2.6
	38	14995	5.6	12530	5.1	10325	4.6	8381	4.1	6693	3.6	5253	3.2	4048	2.8
	43	-	-	11608	5.3	9525	4.8	7692	4.2	6103	3.8	4751	3.3	3623	2.8
	48	-	-	-	-	-	-	7000	4.4	5514	3.9	4253	3.4	3203	2.9
HGM 064	32	21172	6.7	17920	6.2	14934	5.6	12221	5.1	9786	4.5	7626	4.0	5736	3.5
	38	19576	7.2	16551	6.6	13773	6.0	11251	5.4	8989	4.8	6984	4.2	5231	3.6
	43	-	-	15404	6.9	12813	6.3	10458	5.6	8343	4.9	6470	4.3	4830	3.7
	48	-	-	-	-	-	-	9652	5.8	7690	5.1	5951	4.4	4427	3.8
HGM 080	32	25589	8.7	21906	7.9	18450	7.1	15243	6.4	12301	5.7	9634	5.0	7245	4.4
	38	23634	9.3	20229	8.4	17032	7.6	14064	6.9	11342	6.1	8872	5.4	6661	4.7
	43	-	-	18822	8.9	15854	8.0	13094	7.2	10558	6.4	8255	5.7	6190	5.0
	48	-	-	-	-	-	-	12107	7.6	9765	6.8	7633	6.0	5718	5.3
HGM 100	32	29899	9.9	25444	9.1	21318	8.4	17546	7.6	14149	6.9	11127	6.2	8483	5.5
	38	27327	10.6	23213	9.7	19402	8.8	15919	8.0	12784	7.2	9999	6.4	7564	5.6
	43	-	-	-	-	17797	9.2	14566	8.3	11657	7.4	9072	6.5	6814	5.7
	48	-	-	-	-	-	-	-	-	10529	7.6	8149	6.6	6070	5.7
HGM 125	32	40444	12.8	34493	11.7	28959	10.7	23927	9.8	19397	8.9	15374	8.0	11851	7.2
	38	37060	13.7	31570	12.5	26462	11.4	21824	10.3	17653	9.3	13955	8.3	10723	7.4
	43	-	-	29110	13.1	24382	11.9	20089	10.7	16227	9.6	12804	8.6	9814	7.5
	48	-	-	-	-	-	-	18341	11.1	14796	9.9	11651	8.8	8905	7.7
HGM 144	32	44174	14.7	37812	13.4	31894	12.2	26460	11.1	21547	10.1	17171	9.1	13331	8.1
	38	40301	15.7	34456	14.3	29021	12.9	24038	11.7	19538	10.5	15537	9.4	12034	8.3
	43	-	-	31609	15.0	26612	13.5	22028	12.1	17887	10.9	14207	9.6	10987	8.5
	48	-	-	-	-	-	-	19999	12.6	16227	11.2	12872	9.9	9939	8.7
HGM 160	32	49078	16.5	41965	15.1	35368	13.7	29336	12.5	23900	11.3	19074	10.2	14857	9.1
	38	44887	17.7	38336	16.0	32264	14.5	26716	13.1	21722	11.8	17295	10.5	13434	9.3
	43	-	-	-	-	29642	15.2	24524	13.6	19916	12.2	15833	10.8	12274	9.5
	48	-	-	-	-	-	-	-	-	18108	12.6	14370	11.1	11115	9.7

Performance data
60 Hz

MGZ

R404A / R507

Models	TE	0°C		- 5°C		-10°C		- 15°C		- 20°C		- 25°C		- 30°C	
	TA	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.
MGZ 018	27	3981	1.8	3335	1.6	2728	1.5	2175	1.3	1689	1.2	1281	1.0	954	0.9
	32	3515	1.9	2953	1.7	2415	1.5	1915	1.4	1469	1.2	1085	1.1	-	-
	38	3037	1.9	2530	1.7	2047	1.5	1597	1.4	1191	1.2	-	-	-	-
	43	2622	1.9	2191	1.7	1774	1.5	1383	1.4	1025	1.2	-	-	-	-
MGZ 022	27	4791	2.5	4171	2.2	3549	1.9	2940	1.7	2361	1.5	1831	1.2	1366	0.9
	32	4205	2.5	3678	2.2	3140	2.0	2604	1.7	2085	1.4	1599	1.2	1162	0.9
	38	3536	2.6	3098	2.3	2645	2.0	2187	1.7	1736	1.4	1305	1.1	906	0.9
	43	-	-	2596	2.3	2224	1.9	1840	1.6	1452	1.3	1073	1.1	-	-
MGZ 028	27	6616	3.1	5642	2.8	4717	2.5	3860	2.2	3090	1.9	2419	1.7	1857	1.4
	32	5921	3.2	5056	2.9	4226	2.6	3447	2.3	2737	2.0	2107	1.7	1568	1.4
	38	5141	3.3	4377	2.9	3642	2.6	2949	2.3	2309	2.0	1733	1.7	-	-
	43	4448	3.4	3798	3.0	3165	2.6	2561	2.3	1995	2.0	-	-	-	-
MGZ 032	27	7686	3.4	6483	3.1	5372	2.8	4372	2.5	3496	2.2	2753	1.9	2144	1.6
	32	6932	3.5	5845	3.2	4833	2.9	3911	2.6	3093	2.3	2387	1.9	1796	1.6
	38	6068	3.7	5100	3.3	4196	3.0	3367	2.6	2624	2.3	1971	2.0	-	-
	43	5322	3.8	4482	3.4	3691	3.0	2959	2.7	2293	2.3	-	-	-	-
MGZ 036	27	8376	3.9	7156	3.5	5997	3.2	4923	2.8	3957	2.4	3115	2.1	2406	1.8
	32	7522	4.1	6433	3.6	5387	3.2	4405	2.8	3509	2.5	2713	2.1	2029	1.8
	38	6556	4.2	5593	3.7	4662	3.3	3783	2.9	2970	2.5	2236	2.1	-	-
	43	5695	4.3	4871	3.8	4065	3.4	3292	2.9	2567	2.5	-	-	-	-
MGZ 040	27	9138	4.5	7813	4.0	6531	3.6	5324	3.2	4220	2.8	3245	2.4	2417	2.0
	32	8202	4.7	7034	4.2	5889	3.7	4794	3.3	3776	2.8	2858	2.4	2059	2.0
	38	7133	4.8	6123	4.3	5125	3.8	4160	3.3	3249	2.9	2412	2.5	-	-
	43	-	-	5331	4.4	4479	3.9	3643	3.4	2841	2.9	-	-	-	-
MGZ 050	27	11698	5.5	10032	5.0	8434	4.5	6944	4.0	5597	3.5	4421	3.1	3434	2.6
	32	10483	5.7	8983	5.1	7530	4.5	6160	4.0	4904	3.5	3790	3.1	2833	2.7
	38	9177	5.8	7816	5.2	6498	4.6	5250	4.0	4096	3.5	3057	3.1	-	-
	43	-	-	6805	5.2	5649	4.6	4542	4.0	3506	3.5	-	-	-	-
MGZ 064	27	15464	7.0	13272	6.3	11181	5.6	9235	5.0	7470	4.4	5913	3.8	4586	3.2
	32	13928	7.1	11954	6.4	10052	5.7	8259	5.0	6609	4.4	5131	3.8	3845	3.2
	38	12197	7.3	10431	6.5	8719	5.8	7092	5.1	5578	4.4	4200	3.8	-	-
	43	-	-	9130	6.6	7620	5.8	6168	5.0	4799	4.4	-	-	-	-
MGZ 080	27	20039	9.1	17203	8.2	14524	7.3	12049	6.5	9817	5.8	7855	5.0	6182	4.3
	32	18156	9.3	15589	8.4	13140	7.5	10853	6.6	8762	5.8	6898	5.1	5278	4.4
	38	15975	9.6	13669	8.5	11461	7.6	9384	6.7	7467	5.9	5733	5.1	-	-
	43	14053	9.7	12034	8.7	10083	7.7	8227	6.7	6494	5.9	-	-	-	-
MGZ 100	27	22498	9.6	19158	8.8	15994	8.0	13069	7.2	10441	6.4	8154	5.6	6237	4.8
	32	20158	9.9	17152	9.0	14274	8.2	11581	7.3	9126	6.5	6954	5.7	5091	4.9
	38	17565	10.3	14870	9.3	12280	8.3	9840	7.4	7591	6.5	5566	5.7	-	-
	43	15281	10.5	12945	9.4	10677	8.4	8513	7.4	6491	6.5	-	-	-	-
MGZ 125	27	27457	12.5	23613	11.3	19914	10.1	16440	9.0	13263	7.9	10447	6.8	8035	5.7
	32	24613	13.0	21155	11.6	17778	10.3	14556	9.0	11565	7.8	8865	6.6	6507	5.4
	38	21497	13.7	18402	12.0	15346	10.5	12392	9.0	9604	7.6	7040	6.3	-	-
	43	-	-	16067	12.5	13379	10.8	10730	9.1	8182	7.6	-	-	-	-
MGZ 144	27	29940	14.8	25968	13.4	22106	12.0	18457	10.8	15113	9.6	12150	8.5	9624	7.5
	32	26723	15.2	23223	13.7	19777	12.3	16474	11.0	13399	9.8	10624	8.7	8202	7.6
	38	23234	15.7	20158	14.0	17114	12.5	14174	11.2	11403	9.9	8859	8.7	-	-
	43	-	-	17426	14.3	14826	12.7	12277	11.2	9836	9.9	-	-	-	-
MGZ 160	27	31362	17.2	27512	15.5	23670	13.9	19945	12.4	16446	11.0	13275	9.6	10510	8.3
	32	27836	17.7	24500	15.8	21118	14.1	17781	12.5	14589	11.1	11635	9.7	8998	8.3
	38	-	-	21208	16.2	18249	14.4	15299	12.7	12437	11.1	9737	9.7	-	-
	43	-	-	-	-	15732	14.6	13210	12.8	-	-	-	-	-	-

LEGEND
P.F. cooling capacity (W)
P.A. power input (kW)
TE evaporating temperature (°C)
TA ambient temperature (°C)

PERFORMANCE DATA ARE BASED ON
- 60 Hz • Superheat 18 K
- Subcooling 3 K

Performance data
60 Hz

HGZ

R404A / R507

Models	TE	+ 10°C		+ 5°C		0°C		- 5°C		- 10°C		- 15°C		- 20°C		- 25°C		- 30°C	
	TA	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.
HGZ 018	32	5024	2.2	4364	2.0	3714	1.8	3090	1.7	2504	1.5	1971	1.4	1501	1.2	1204	1.0	850	0.9
	38	4333	2.3	3756	2.1	3188	1.9	2641	1.7	2126	1.5	1652	1.4	1230	1.2	925	1.1	593	0.9
	43	-	-	3244	2.2	2759	1.9	2289	1.7	1842	1.5	1428	1.4	1053	1.2	772	1.1	466	0.9
	48	-	-	-	-	-	-	1950	1.7	1578	1.5	1230	1.3	910	1.2	655	1.0	383	0.9
HGZ 022	32	6630	2.9	5844	2.7	5071	2.4	4319	2.2	3599	1.9	2922	1.7	2300	1.5	1741	1.2	1255	0.9
	38	5714	3.0	5029	2.8	4356	2.5	3702	2.2	3073	2.0	2478	1.7	1925	1.4	1422	1.2	974	0.9
	43	4879	3.2	4306	2.9	3739	2.6	3182	2.3	2642	2.0	2125	1.7	1637	1.4	1186	1.1	776	0.8
	48	-	-	-	-	3083	2.6	2631	2.3	2185	1.9	1751	1.6	1335	1.3	942	1.0	577	0.7
HGZ 028	32	8696	3.7	7583	3.4	6510	3.1	5491	2.8	4540	2.5	3671	2.2	2895	2.0	2220	1.7	1649	1.4
	38	7607	3.9	6619	3.5	5668	3.2	4765	2.9	3920	2.6	3144	2.3	2443	2.0	1824	1.7	1290	1.4
	43	-	-	5770	3.7	4949	3.3	4165	3.0	3425	2.6	2740	2.3	2114	2.0	1553	1.6	1059	1.3
	48	-	-	-	-	-	-	3547	3.0	2922	2.6	2336	2.3	1794	1.9	1300	1.6	856	1.3
HGZ 032	32	10379	4.0	8937	3.7	7581	3.4	6325	3.1	5182	2.8	4165	2.5	3278	2.2	2524	1.9	1901	1.6
	38	9218	4.2	7905	3.9	6675	3.6	5539	3.2	4505	2.9	3580	2.6	2768	2.3	2069	2.0	1478	1.7
	43	8185	4.4	7023	4.1	5931	3.7	4920	3.3	3995	3.0	3164	2.6	2428	2.3	1787	2.0	1237	1.7
	48	-	-	-	-	5156	3.8	4283	3.4	3481	3.0	2756	2.7	2108	2.3	1537	2.0	1039	1.6
HGZ 036	32	11113	4.8	9698	4.3	8332	3.9	7035	3.5	5827	3.2	4724	2.8	3739	2.5	2882	2.1	2156	1.8
	38	9846	5.0	8562	4.5	7328	4.1	6157	3.7	5065	3.3	4063	2.9	3162	2.5	2366	2.1	1678	1.8
	43	-	-	7554	4.7	6470	4.2	5436	3.8	4465	3.3	3567	2.9	2751	2.5	2022	2.1	1380	1.7
	48	-	-	-	-	-	-	4683	3.9	3847	3.4	3066	2.9	2347	2.5	1696	2.1	1113	1.7
HGZ 040	32	13473	5.2	11641	4.8	9899	4.4	8268	4.0	6764	3.6	5404	3.2	4198	2.8	3152	2.4	2270	2.0
	38	11923	5.5	10289	5.0	8737	4.6	7281	4.1	5934	3.7	4709	3.3	3612	2.9	2647	2.5	1815	2.1
	43	10569	5.7	9135	5.2	7768	4.7	6479	4.3	5281	3.8	4182	3.3	3189	2.9	2306	2.5	1532	2.1
	48	-	-	7923	5.4	6751	4.9	5641	4.4	4603	3.9	3645	3.4	2770	2.9	1982	2.5	1280	2.1
HGZ 050	32	16237	6.6	14143	6.0	12124	5.5	10212	5.0	8435	4.5	6820	4.0	5386	3.5	4144	3.1	3100	2.7
	38	14290	6.9	12406	6.3	10592	5.7	8872	5.1	7269	4.5	5804	4.0	4491	3.5	3339	3.1	2348	2.6
	43	-	-	10898	6.4	9301	5.8	7779	5.2	6352	4.6	5037	4.0	3847	3.5	2789	3.0	1866	2.6
	48	-	-	-	-	-	-	6665	5.2	5428	4.6	4278	4.0	3227	3.5	2281	3.0	1439	2.5
HGZ 064	32	20966	8.3	18287	7.6	15718	6.9	13291	6.3	11033	5.6	8970	5.0	7122	4.4	5502	3.8	4115	3.2
	38	18588	8.7	16163	7.9	13839	7.1	11641	6.4	9589	5.7	7704	5.1	5999	4.4	4484	3.8	3163	3.2
	43	16461	8.9	14322	8.1	12260	7.3	10298	6.5	8455	5.8	6748	5.1	5189	4.4	3788	3.7	2548	3.1
	48	-	-	-	-	10613	7.4	8908	6.6	7293	5.8	5783	5.0	4390	4.3	3122	3.6	1982	3.0
HGZ 080	32	25074	11.2	22052	10.2	19118	9.2	16313	8.3	13679	7.4	11250	6.6	9056	5.8	7117	5.1	5446	4.4
	38	22181	11.6	19475	10.5	16845	9.5	14325	8.5	11947	7.6	9740	6.7	7726	5.9	5922	5.1	4336	4.4
	43	19565	12.0	17204	10.8	14893	9.7	12664	8.6	10544	7.6	8558	6.7	6727	5.9	5066	5.1	3584	4.4
	48	-	-	-	-	-	-	10931	8.7	9094	7.7	7355	6.7	5732	5.9	4240	5.0	2885	4.3
HGZ 100	32	28868	10.9	25232	10.6	21695	9.7	18311	8.9	15135	8.1	12215	7.3	9595	6.5	7305	5.7	5361	4.9
	38	25321	11.5	22071	11.1	18909	10.1	15879	9.2	13022	8.3	10377	7.4	7977	6.5	5845	5.7	3994	4.9
	43	-	-	-	-	16531	10.4	13874	9.4	11348	8.4	8986	7.4	6817	6.5	4861	5.6	3131	4.8
	48	-	-	-	-	-	-	-	-	9681	8.5	7633	7.4	5727	6.5	3979	5.5	2401	4.7
HGZ 125	32	39314	14.1	34208	13.2	29333	12.2	24736	11.2	20464	10.1	16560	9.0	13057	7.9	9981	6.7	7345	5.5
	38	34883	15.2	30232	14.0	25786	12.8	21582	11.5	17656	10.3	14040	9.0	10762	7.7	7842	6.4	5288	5.2
	43	30930	16.2	26823	14.8	22868	13.4	19097	11.9	15543	10.5	12237	9.0	9206	7.6	6469	6.3	4039	4.9
	48	-	-	-	-	-	-	16601	12.4	13459	10.8	10501	9.2	7752	7.6	5234	6.1	2958	4.7
HGZ 144	32	42531	17.4	37243	15.9	32139	14.5	27297	13.2	22788	12.0	18676	10.8	15007	9.7	11813	8.6	9105	7.5
	38	37690	18.2	32899	16.5	28288	15.0	23920	13.6	19848	12.3	16119	11.0	12767	9.8	9810	8.7	7254	7.6
	43	-	-	28987	17.1	24949	15.5	21100	13.9	17489	12.5	14156	11.2	11131	9.9	8431	8.7	6059	7.6
	48	-	-	-	-	-	-	18174	14.2	15060	12.7	12162	11.3	9506	9.9	7104	8.6	4958	7.5
HGZ 160	32	46676	19.7	41034	18.1	35568	16.6	30353	15.1	25463	13.7	20963	12.3	16909	10.9	13340	9.6	10278	8.3
	38	41130	20.7	36103	18.9	31233	17.2	26580	15.6	22199	14.0	18142	12.5	14450	11.1	11154	9.7	8269	8.3
	43	-	-	31759	19.6	27508	17.7	23420	16.0	19544	14.3	15922	12.7	12592	11.1	9580	9.6	6899	8.3
	48	-	-	-	-	-	-	20152	16.3	16822	14.5	13679	12.7	10754	11.1	8069	9.5	5637	8.1

Performance data
60 Hz

MGZ

R134a

Models	TE	+ 10°C		+ 5°C		0°C		- 5°C		- 10°C		- 15°C	
	TA	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.
MGZ 018	27	4152	1.2	3398	1.0	2739	1.0	2176	0.9	1706	0.8	1325	0.7
	32	3872	1.2	3158	1.1	2533	1.0	1997	0.9	1550	0.8	1185	0.7
	38	3511	1.3	2855	1.2	2279	1.0	1783	0.9	1367	0.8	1026	0.7
	43	3203	1.4	2594	1.2	2056	1.1	1594	0.9	1205	0.8	887	0.7
MGZ 022	27	5226	1.5	4330	1.4	3517	1.2	2797	1.1	2172	1.0	1644	0.9
	32	4868	1.6	4033	1.4	3274	1.3	2598	1.2	2009	1.0	1509	0.9
	38	4391	1.7	3645	1.5	2961	1.3	2347	1.2	1809	1.0	1348	0.9
	43	-	-	3307	1.5	2683	1.4	2122	1.2	1628	1.0	1201	0.9
MGZ 028	27	6852	2.0	5730	1.8	4702	1.6	3775	1.4	2951	1.3	2231	1.1
	32	6441	2.1	5379	1.9	4404	1.7	3521	1.5	2732	1.3	2039	1.1
	38	5911	2.2	4931	2.0	4026	1.7	3202	1.5	2462	1.3	1806	1.1
	43	5450	2.3	4539	2.0	3695	1.8	2923	1.6	2225	1.3	1604	1.1
MGZ 032	27	7726	2.2	6380	2.1	5150	1.9	4044	1.7	3067	1.5	2222	1.3
	32	7263	2.3	6014	2.2	4870	2.0	3836	1.8	2919	1.5	2120	1.3
	38	6646	2.5	5525	2.3	4493	2.0	3555	1.8	2717	1.6	1980	1.4
	43	6084	2.6	5071	2.4	4136	2.1	3283	1.9	2518	1.6	1841	1.4
MGZ 036	27	8668	2.7	7277	2.5	6015	2.2	4886	2.0	3893	1.7	3033	1.5
	32	8136	2.8	6817	2.6	5617	2.3	4540	2.0	3589	1.8	2762	1.5
	38	7462	2.9	6242	2.6	5127	2.4	4122	2.1	3228	1.8	2446	1.5
	43	6886	3.0	5748	2.7	4705	2.4	3762	2.1	2920	1.8	2179	1.5
MGZ 040	27	9690	3.1	8212	2.8	6889	2.5	5719	2.3	4698	2.0	3819	1.7
	32	9094	3.2	7662	2.9	6378	2.6	5241	2.3	4246	2.0	3386	1.7
	38	8395	3.3	7025	3.0	5794	2.6	4700	2.3	3739	2.0	2906	1.7
	43	-	-	6505	3.0	5316	2.6	4258	2.3	3326	2.0	2515	1.7
MGZ 050	27	11888	3.6	9906	3.3	8101	3.0	6492	2.7	5087	2.4	3892	2.1
	32	11251	3.7	9355	3.4	7629	3.0	6087	2.7	4740	2.4	3588	2.1
	38	10312	3.9	8563	3.5	6967	3.1	5536	2.8	4280	2.4	3200	2.1
	43	-	-	7871	3.6	6390	3.2	5060	2.8	3889	2.5	2877	2.1
MGZ 064	27	15999	4.6	13457	4.2	11118	3.8	8997	3.4	7107	3.0	5453	2.6
	32	15045	4.8	12645	4.3	10429	3.9	8413	3.5	6607	3.1	5016	2.7
	38	13815	5.0	11610	4.5	9564	4.0	7691	3.6	6002	3.1	4501	2.7
	43	12743	5.2	10703	4.6	8802	4.1	7055	3.6	5471	3.2	4056	2.7
MGZ 080	27	20304	5.9	17138	5.3	14231	4.8	11597	4.3	9243	3.8	7172	3.3
	32	19157	6.1	16151	5.5	13382	4.9	10863	4.4	8602	3.9	6601	3.4
	38	17698	6.3	14909	5.7	12326	5.1	9964	4.5	7831	4.0	5930	3.5
	43	16413	6.5	13809	5.8	11390	5.2	9169	4.6	7153	4.0	5346	3.5
MGZ 100	27	23302	6.3	19372	5.8	15803	5.3	12618	4.8	9828	4.2	7435	3.7
	32	21710	6.6	18007	6.0	14634	5.5	11614	4.9	8957	4.3	6663	3.8
	38	19700	6.9	16304	6.3	13198	5.6	10401	5.0	7926	4.4	5773	3.8
	43	17967	7.1	14830	6.4	11952	5.7	9352	5.1	7040	4.4	5018	3.8
MGZ 125	27	28368	7.7	23711	7.0	19435	6.3	15584	5.6	12186	4.9	9255	4.3
	32	26371	8.0	22013	7.2	18000	6.4	14371	5.7	11153	5.0	8359	4.3
	38	23834	8.3	19881	7.4	16222	6.6	12894	5.8	9922	5.0	7319	4.3
	43	-	-	18054	7.6	14698	6.7	11633	5.8	8881	5.0	6455	4.3
MGZ 144	27	32363	9.8	27569	9.0	23112	8.2	19031	7.5	15355	6.7	12104	5.9
	32	30253	10.2	25775	9.3	21593	8.5	17743	7.7	14255	6.8	11147	6.0
	38	27509	10.8	23464	9.8	19658	8.8	16126	7.9	12898	7.0	9994	6.1
	43	-	-	-	-	17980	9.0	14714	8.0	11710	7.0	8988	6.1
MGZ 160	27	34763	11.3	29769	10.2	25084	9.2	20758	8.2	16832	7.3	13333	6.4
	32	32467	11.6	27797	10.5	23397	9.4	19313	8.4	15585	7.4	12240	6.5
	38	-	-	25254	10.8	21244	9.7	17492	8.5	14038	7.5	10909	6.6
	43	-	-	-	-	19398	9.8	15916	8.6	12690	7.6	9748	6.6

LEGEND
P.F. cooling capacity (W)
P.A. power input (kW)
TE evaporating temperature (°C)
TA ambient temperature (°C)

PERFORMANCE DATA ARE BASED ON
• 60 Hz • Superheat 18 K
• Subcooling 3 K

Performance data
60 Hz

HGZ

R134a

Models	TE	+ 20°C		+ 15°C		+ 10°C		+ 5°C		0°C		- 5°C		- 10°C	
	TA	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.
HGZ 018	32	5739	1.5	4818	1.3	3983	1.2	3240	1.1	2592	1.0	2041	0.9	1582	0.8
	38	5227	1.6	4386	1.4	3620	1.3	2935	1.1	2336	1.0	1824	0.9	1397	0.8
	43	-	-	-	-	3309	1.3	2670	1.2	2111	1.1	1633	0.9	1233	0.8
	48	-	-	-	-	-	-	2399	1.2	1883	1.1	1440	0.9	1070	0.8
HGZ 022	32	7627	1.7	6437	1.6	5350	1.5	4372	1.4	3506	1.2	2753	1.1	2112	1.0
	38	6992	1.9	5903	1.7	4905	1.6	4004	1.4	3205	1.3	2509	1.2	1913	1.0
	43	-	-	5432	1.8	4509	1.7	3676	1.5	2935	1.3	2289	1.2	1735	1.0
	48	-	-	-	-	-	-	3324	1.5	2647	1.4	2056	1.2	1548	1.0
HGZ 028	32	9378	2.3	8026	2.1	6772	2.0	5622	1.8	4580	1.6	3645	1.5	2820	1.3
	38	8656	2.5	7409	2.3	6248	2.1	5179	1.9	4205	1.7	3329	1.5	2550	1.3
	43	-	-	6866	2.5	5784	2.2	4784	2.0	3871	1.8	3046	1.5	2310	1.3
	48	-	-	-	-	-	-	4366	2.1	3518	1.8	2750	1.6	2061	1.3
HGZ 032	32	10639	2.6	9052	2.4	7580	2.3	6232	2.1	5013	1.9	3926	1.7	2973	1.5
	38	9808	2.8	8357	2.6	7012	2.4	5778	2.2	4660	2.0	3661	1.8	2780	1.6
	43	9050	2.9	7718	2.7	6483	2.5	5350	2.3	4323	2.1	3403	1.8	2590	1.6
	48	-	-	-	-	5903	2.6	4877	2.4	3947	2.1	3113	1.9	2374	1.6
HGZ 036	32	11794	3.2	10101	2.9	8543	2.7	7123	2.5	5845	2.3	4709	2.0	3713	1.8
	38	10950	3.4	9365	3.1	7903	2.8	6570	2.6	5367	2.3	4295	2.1	3352	1.8
	43	-	-	8720	3.2	7344	2.9	6087	2.7	4951	2.4	3937	2.1	3042	1.8
	48	-	-	-	-	-	-	5587	2.7	4524	2.4	3573	2.1	2732	1.8
HGZ 040	32	13956	3.5	11929	3.3	10101	3.0	8466	2.8	7018	2.5	5748	2.3	4646	2.0
	38	13059	3.7	11113	3.4	9356	3.2	7783	2.9	6388	2.6	5162	2.3	4096	2.0
	43	12320	3.9	10440	3.6	8741	3.3	7220	2.9	5869	2.6	4681	2.3	3646	2.0
	48	-	-	-	-	8137	3.3	6672	3.0	5371	2.6	4224	2.3	3224	2.0
HGZ 050	32	17426	4.2	14767	3.9	12331	3.5	10131	3.2	8175	2.9	6467	2.7	5001	2.4
	38	16038	4.5	13587	4.1	11335	3.7	9298	3.4	7482	3.0	5891	2.7	4520	2.4
	43	-	-	12565	4.3	10469	3.9	8570	3.5	6877	3.1	5391	2.8	4108	2.5
	48	-	-	-	-	-	-	7812	3.6	6252	3.2	4882	2.8	3697	2.5
HGZ 064	32	22281	5.3	19090	4.9	16137	4.6	13434	4.2	10987	3.8	8800	3.4	8800	3.4
	38	20619	5.7	17672	5.2	14936	4.8	12422	4.4	10138	3.9	8088	3.5	8088	3.5
	43	19154	6.0	16412	5.5	13862	5.0	11514	4.5	9376	4.0	7450	3.6	7450	3.6
	48	-	-	-	-	12724	5.2	10554	4.7	8572	4.1	6782	3.6	6782	3.6
HGZ 080	32	26775	7.2	23127	6.6	19720	6.0	16571	5.4	13692	4.9	11089	4.4	8766	3.9
	38	24791	7.5	21418	6.9	18257	6.2	15323	5.6	12628	5.0	10181	4.5	7984	4.0
	43	-	-	19919	7.1	16968	6.4	14221	5.8	11690	5.2	9383	4.6	7303	4.0
	48	-	-	-	-	-	-	13067	5.9	10709	5.3	8552	4.6	6600	4.1
HGZ 100	32	31813	7.4	27113	6.9	22761	6.4	18783	5.9	15200	5.4	12021	4.9	9248	4.3
	38	28985	7.9	24692	7.3	20703	6.7	17044	6.2	13733	5.6	10782	5.0	8193	4.4
	43	-	-	22637	7.7	18939	7.0	15541	6.3	12461	5.7	9708	5.1	7284	4.4
	48	-	-	-	-	-		13972	6.5	11143	5.8	8609	5.1	6369	4.4
HGZ 125	32	41180	8.9	35004	8.3	29317	7.6	24148	6.9	19516	6.3	15428	5.6	11881	5.0
	38	37762	9.4	32071	8.7	26822	7.9	22041	7.2	17747	6.5	13945	5.7	10631	5.0
	43	34788	9.9	29501	9.0	24624	8.2	20179	7.4	16183	6.6	12639	5.8	9543	5.0
	48	-	-	-	-	22337	8.4	18255	7.6	14582	6.7	11320	5.8	8463	5.0
HGZ 144	32	45396	10.7	39204	10.1	33446	9.5	28148	8.9	23326	8.2	18992	7.5	15145	6.7
	38	41945	11.5	36231	10.8	30903	10.1	25984	9.3	21491	8.5	17435	7.7	13817	6.9
	43	-	-	33598	11.4	28634	10.5	24043	9.7	19841	8.8	16035	7.9	12628	7.0
	48	-	-	-	-	-	-	21983	10.0	18098	9.0	14568	8.0	11395	7.1
HGZ 160	32	50181	12.6	43394	11.7	37075	10.8	31255	9.9	25951	9.0	21176	8.2	16932	7.3
	38	46414	13.4	40125	12.4	34255	11.3	28831	10.3	23872	9.3	19390	8.4	15386	7.4
	43	-	-	37253	12.9	31775	11.8	26699	10.6	22046	9.6	17826	8.5	14043	7.5
	48	-	-	-	-	-	-	24410	10.9	20089	9.8	16157	8.6	12618	7.6

Performance data
60 Hz

LGZ

R404A / R507

Models	TE	- 20°C		- 25°C		- 30°C		- 35°C		- 40°C	
	TA	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.	P.F.	P.A.
LGZ 022	27	2623	1.9	2108	1.6	1646	1.4	1245	1.1	913	0.9
	32	2294	1.9	1838	1.6	1424	1.4	1063	1.1	759	0.9
	38	1920	2.0	1528	1.7	1172	1.4	860	1.1	594	0.9
	43	1638	2.0	1306	1.7	1004	1.4	736	1.1	-	-
	48	1380	2.0	1113	1.7	868	1.4	-	-	-	-
LGZ 028	27	3818	2.8	3094	2.4	2451	2.0	1896	1.6	1434	1.3
	32	3382	2.8	2730	2.4	2145	2.0	1637	1.6	1209	1.3
	38	2872	2.9	2292	2.4	1774	2.0	1322	1.7	937	1.4
	43	2480	2.9	1973	2.4	1518	2.0	1117	1.7	772	1.4
	48	2098	2.4	1670	2.5	1283	2.0	939	1.7	-	-
LGZ 044	27	6646	4.7	5302	4.1	4117	3.6	3105	3.1	2273	2.6
	32	5874	4.7	4668	4.2	3601	3.6	2685	3.1	1922	2.6
	38	4977	4.8	3914	4.2	2981	3.6	2180	3.1	1507	2.6
	43	4275	4.8	3354	4.2	2546	3.6	1849	3.0	1259	2.5
	48	3583	4.8	2817	4.2	2144	3.6	1562	3.0	1063	2.4
LGZ 050	27	8526	5.8	6859	5.2	5408	4.5	4181	3.9	3173	3.3
	32	7621	5.9	6115	5.2	4799	4.6	3679	3.9	2749	3.3
	38	6527	6.0	5197	5.2	4038	4.6	3049	3.9	2221	3.3
	43	5662	6.0	4494	5.2	3475	4.5	2604	3.9	1868	3.2
	48	4802	6.0	3805	5.2	2936	4.5	2191	3.8	1556	3.1
LGZ 088	27	12854	8.5	10142	7.4	7794	6.5	5824	5.7	4221	4.9
	32	11539	8.8	9081	7.7	6944	6.7	5138	5.8	3654	5.0
	38	9918	9.1	7729	7.9	5829	6.8	4223	5.8	2895	5.0
	43	8594	9.3	6659	7.9	4976	6.8	3547	5.8	2357	4.8
	48	7240	9.4	5574	7.9	4119	6.7	2880	5.6	1840	4.6
LGZ 100	27	15376	11.1	12481	9.7	9891	8.4	7642	7.3	5746	6.2
	32	13703	11.4	11100	9.9	8751	8.5	6692	7.3	4934	6.1
	38	11754	11.7	9430	10.0	7332	8.5	5484	7.2	3891	5.9
	43	10111	11.9	8079	10.1	6228	8.5	4582	7.0	3145	5.7
	48	-	-	6716	10.1	5128	8.3	3699	6.8	2431	5.4

LEGEND
P.F. cooling capacity (W)
P.A. power input (kW)
TE evaporating temperature (°C)
TA ambient temperature (°C)

PERFORMANCE DATA ARE BASED ON
• 60 Hz • Superheat 18 K
• Subcooling 3 K

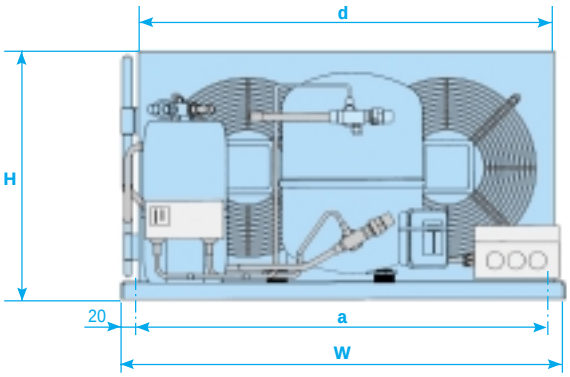
LGZ condensing units, designed for low temperature application, are fitted with LTZ hermetic compressors.

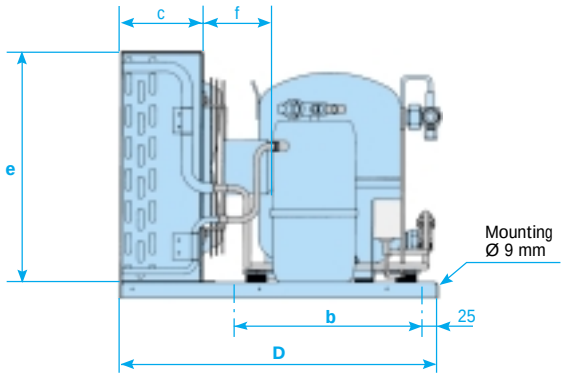
The LTZ low temperature compressors have been designed and optimised for a reliable and efficient running operation within the evaporating temperature range -20°C to -40°C.

Warnings:

1. The use of an expansion valve with maximum operating pressure (MOP) set at -20°C or a starting regulator is compulsory.
2. Use only R404A / R507 specified components (i.e. filter drier, TXV,...).
3. The crankcase heater factory fitted must be permanently energized (self regulating PTC).

Overall dimensions





Models	Overall dimensions			Base mounting		Condenser			
	W (mm)	D (mm)	H (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)*
MGM / MGZ 018	700	500	392	660	300	130	647	367	105
MGM / MGZ 022	700	500	392	660	300	130	647	367	105
MGM / MGZ 028	800	600	442	760	400	145	747	417	75/105**
MGM / MGZ 032	800	600	442	760	400	145	747	417	75/105**
MGM / MGZ 036	800	600	442	760	400	145	747	417	75/105**
MGM / MGZ 040	800	600	442	760	400	145	747	417	75/105**
MGM / MGZ 050	1000	700	555	960	460	200	937	520	75/105**
MGM / MGZ 064	1000	700	555	960	460	200	937	520	75/105**
MGM / MGZ 080	1200	800	671	1160	500	225	1132	621	135/150**
MGM / MGZ 100	1200	800	671	1160	500	225	1132	621	135/150**
MGM / MGZ 125	1200	800	671	1160	500	225	1132	621	135/150**
MGM / MGZ 144	1200	800	671	1160	500	225	1132	621	135/150**
MGM / MGZ 160	1200	800	671	1160	500	225	1132	621	135/150**
HGM / HGZ 018	700	500	392	660	300	130	647	367	105
HGM / HGZ 022	800	600	442	760	400	145	747	417	75/105**
HGM / HGZ 028	800	600	442	760	400	145	747	417	75/105**
HGM / HGZ 032	1000	700	555	960	460	200	937	520	75/105**
HGM / HGZ 036	1000	700	555	960	460	200	937	520	75/105**
HGM / HGZ 040	1000	700	555	960	460	200	937	520	75/105**
HGM / HGZ 050	1000	700	555	960	460	200	937	520	75/105**
HGM / HGZ 064	1200	800	671	1160	500	225	1132	621	135/150**
HGM / HGZ 080	1200	800	671	1160	500	225	1132	621	135/150**
HGM / HGZ 100	1200	800	671	1160	500	225	1132	621	135/150**
HGM / HGZ 125	1500	870	975	1460	500	225	1432	925	240
HGM / HGZ 144	1500	870	975	1460	500	225	1432	925	240
HGM / HGZ 160	1500	870	975	1460	500	225	1432	925	240
LGZ 022	700	500	392	660	300	130	647	367	105
LGZ 028	800	600	442	760	400	145	747	417	75/105**
LGZ 044	1000	700	555	960	460	200	937	520	75/105**
LGZ 050	1000	700	555	960	460	200	937	520	75/105**
LGZ 088	1200	800	671	1160	500	225	1132	621	135/150**
LGZ 100	1200	800	671	1160	500	225	1132	621	135/150**

Note: * value without cable gland.
** depending on fan brand mark and on the fan voltage code.

Electrical data
60 Hz

ELECTRICAL CHARACTERISTICS

Models	Compressor						Fans *					
	Locked rotor current (A)			Max. continuous current MCC (A)			Max. current (A)			Power input (W)		
	230 V/1	230 V/3	380 V/3	230 V/1	230 V/3	380 V/3	220 V/1	230 V/3	380 V/3	220 V/1	230 V/3	380 V/3
MGM / MGZ 018	51	38	-	13	9	-	2x0.55	-	-	2x80	-	-
MGM / MGZ 022	49.3	38	-	17	11	-	2x0.55	-	-	2x80	-	-
MGM / MGZ 028	81	57	-	25	16	-	2x1.2	2x0.87	2x0.5	2x230	2x220	2x220
MGM / MGZ 032	84	60	-	26.5	18	-	2x1.2	2x0.87	2x0.5	2x230	2x220	2x220
MGM /MGZ 036	84	74	-	30	17	-	2x1.2	2x0.87	2x0.5	2x230	2x220	2x220
MGM / MGZ 040	99	98	-	34	22	-	2x1.2	2x0.87	2x0.5	2x230	2x220	2x220
MGM / MGZ 050	143	117	68	37	23	15	2x1.3	2x1.21	2x0.7	2x240	2x250	2x250
MGM / MGZ 064	148	128	68	53	31	17	2x1.3	2x1.21	2x0.7	2x240	2x250	2x250
MGM / MGZ 080	-	155	85	-	42	22	2x2.15	2x1.25	-	2x450	2x450	-
MGM / MGZ 100	-	157	92	-	43	24	2x4	2x2.15	2x1.25	2x750	2x450	2x450
MGM / MGZ 125	-	210	129	-	54	29	2x4	2x2.15	2x1.25	2x750	2x450	2x450
MGM / MGZ 144	-	259	143	-	64	36	2x4	2x2.15	2x1.25	2x750	2x450	2x450
MGM / MGZ 160	-	259	143	-	70	36	2x4	2x2.15	2x1.25	2x750	2x450	2x450
HGM / HGZ 018	51	38	-	13	9	-	2x0.55	-	-	2x80	-	-
HGM / HGZ 022	49.3	38	-	17	11	-	2x1.2	2x0.87	2x0.5	2x230	2x220	2x220
HGM / HGZ 028	81	57	-	25	16	-	2x1.2	2x0.87	2x0.5	2x230	2x220	2x220
HGM / HGZ 032	84	60	-	26.5	18	-	2x1.3	2x1.21	2x0.7	2x240	2x250	2x250
HGM / HGZ 036	84	74	-	30	17	-	2x1.3	2x1.21	2x0.7	2x240	2x250	2x250
HGM / HGZ 040	99	98	-	34	22	-	2x1.3	2x1.21	2x0.7	2x240	2x250	2x250
HGM / HGZ 050	143	117	68	37	23	15	2x1.3	2x1.21	2x0.7	2x240	2x250	2x250
HGM / HGZ 064	148	128	68	53	31	17	2x4	2x2.15	2x1.25	2x750	2x450	2x450
HGM / HGZ 080	-	155	85	-	42	22	2x4	2x2.15	2x1.25	2x750	2x450	2x450
HGM / HGZ 100	-	157	92	-	43	24	2x4	2x2.15	2x1.25	2x750	2x450	2x450
HGM / HGZ 125	-	210	129	-	54	29	2x4.35	2x3.38	2x1.95	2x775	2x870	2x870
HGM / HGZ 144	-	259	143	-	64	36	2x4.35	2x3.38	2x1.95	2x775	2x870	2x870
HGM / HGZ 160	-	259	143	-	70	36	2x4.35	2x3.38	2x1.95	2x775	2x870	2x870
LGZ 022	49.3	38	22	17	11	5	2x0.55	-	-	2x80	-	-
LGZ 028	81	57	29	25	16	8.5	2x1.2	2x0.87	2x0.5	2x230	2x220	2x220
LGZ 044	103	100	57	34	22	11	2x1.3	2x1.21	2x0.7	2x240	2x250	2x250
LGZ 050	143	117	64	37	23	15	2x1.3	2x1.21	2x0.7	2x240	2x250	2x250
LGZ 088	-	157	110	-	43	23	2x4	2x2.15	2x1.25	2x750	2x450	2x450
LGZ 100	-	210	150	-	54	30	2x4	2x2.15	2x1.25	2x750	2x450	2x450

Note: * fan electrical data may slightly vary depending on motor manufacturer.

MCC is the maximum current at which compressor internal protector cuts out.

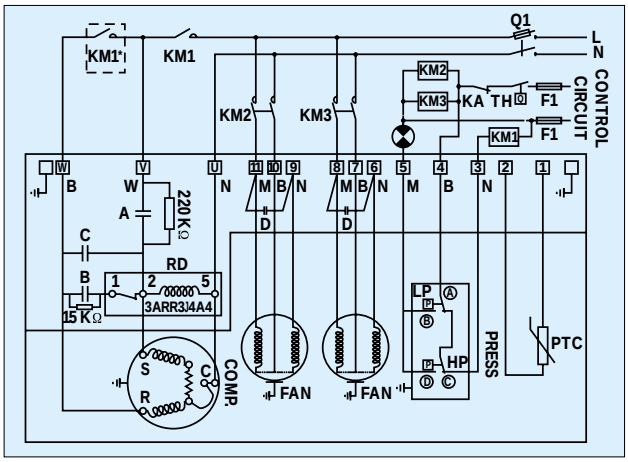
Under normal conditions the condensing unit operating current will be lower.

All power wiring must comply with applicable local and national codes.

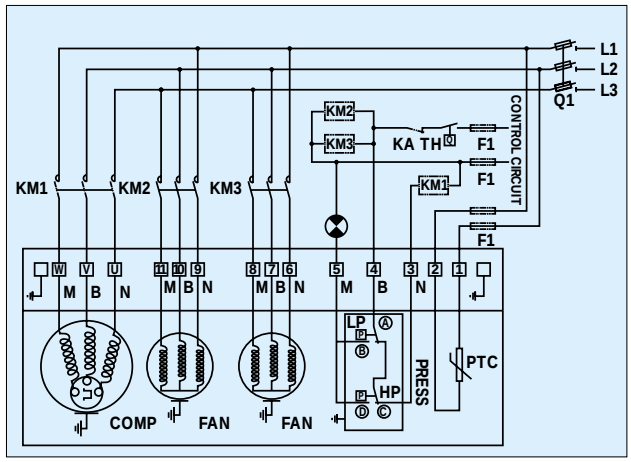
Install field supply fused disconnect (time delay or time lag fuses) specific for motors.
Do not undersize contactors which could result in a motor burn-out.

For quick contactor selection refer to the Danfoss brochures “Contactors for Danfoss Maneurop compressors and condensing units” and “Definite Purpose Contactors”.

ELECTRICAL CONNECTIONS



Typical single phase wiring diagram (N), without Pump Down cycle



Typical three phase wiring diagram (P), without Pump Down cycle

Legend

1. CONDENSING UNIT COMPONENTS

Comp	compressor
Fan	condenser fan motor
Press	HP/LP switch
PTC	crankcase heater

2. UNIT TERMINAL BOX

RD	compressor starting relay
A, B, C	compressor capacitors (refer to table below)
D	fan capacitors
1-11 and U-V-W	electrical terminals
N	black wire
B	blue wire
M	brown wire
W	white wire

3. FIELD WIRING

TH	control (thermostat)
KA	external control, safety devices,…
KM1	compressor contactor
KM1*	position for trickle heat circuit
KM2-KM3	fan contactor
Q1	fused disconnect
F1	fuses

For further electrical diagram details, please contact Danfoss Maneurop Sales Organisation.

A wiring diagram is included in the electrical box of each condensing unit. Danfoss Maneurop terminal boxes are equipped with screw type connector blocks, for both power connectors and controls.

CAPACITORS TABLE FOR SINGLE PHASE VERSION

Condensing units models	Capacitors	Compressor		
		Run A	Run C	Start B
MGM / MGZ 018 HGM / HGZ 018	Typ (µF) Ref.:	15	10	100
MGM / MGZ 022 / LGZ 022 HGM / HGZ 022	Typ (µF) Ref.:	15	30	100
MGM / MGZ 028 / LGZ 028 HGM / HGZ 028	Typ (µF) Ref.:	25	25	135
MGM / MGZ 032 - 036 HGM / HGZ 032 - 036	Typ (µF) Ref.:	25	20	100
MGM / MGZ 040 HGM / HGZ 040	Typ (µF) Ref.:	35	20	100
MGM / HGZ 050 / LGZ 044 - 050 HGM / HGZ 050	Typ (µF) Ref.:	30	15	135
MGM / MGZ 064 HGM / HGZ 064	Typ (µF) Ref.:	30	25	235

A single run capacitor might be used for total A + C values.
For fan motor capacitor value (D), refer to the wiring diagram inside the unit electrical box.

Installation and service

UNIT SITE LOCATION AND WEATHERPROOF HOUSING

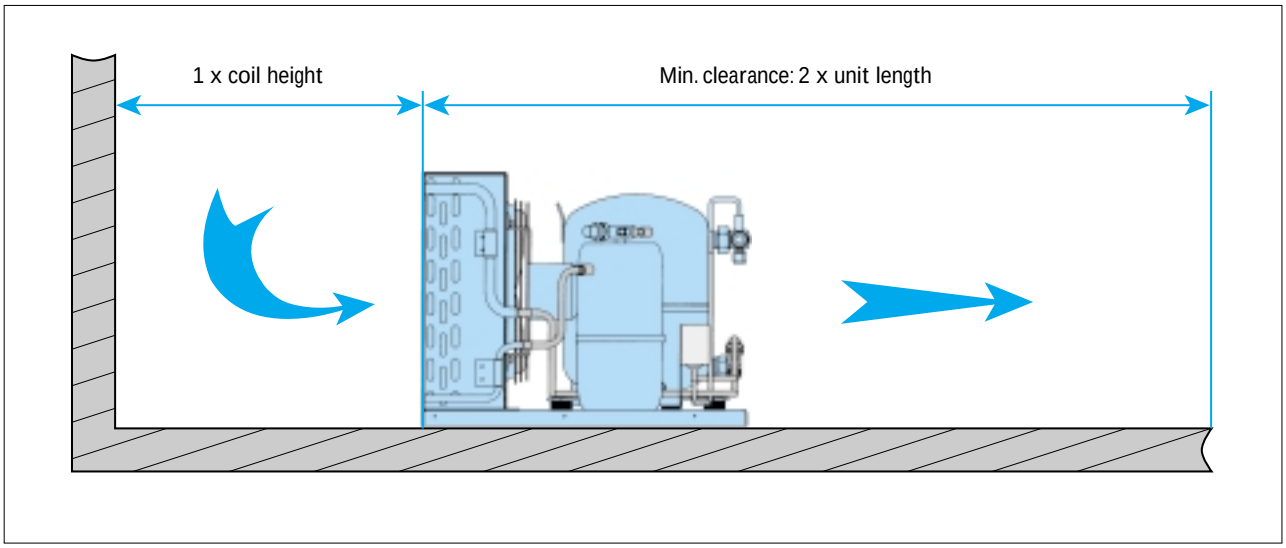
The condensing unit must be located in a well ventilated area, air flow through the unit shall not be restricted in any way.
It is important to check there is no condenser air flow recirculation and that ambient air temperature will be always in conformity with condensing unit selection.

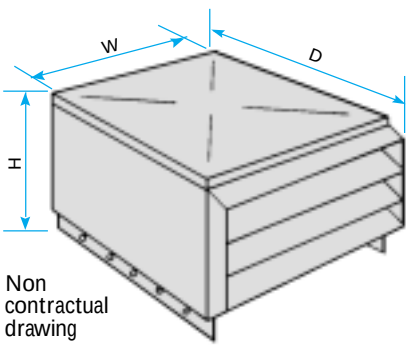
Be sure the unit is protected from prevailing winds.

Check for proper fan rotation: air towards the compressor.

To optimize the unit running conditions, the condenser coil must be cleanned at regular intervals.

Recommended unit site installation





Non contractual drawing

Weatherproof housing accessory

For outdoor installation, provide a shelter or use the Bluestar weatherproof housing.
Danfoss can deliver the following housings.

When the condensing unit is installed in a factory assembled refrigeration machine check that the machine casing does not restrict the condenser air flow.

Condensing unit models			Dimensions			Size
			W	D	H	
MGM / MGZ 018 - 022	HGM / HGZ 018	LGZ 022	750	575	435	1 G
MGM / MGZ 028 - 040	HGM / HGZ 022 - 028	LGZ 028	850	675	485	2 G
MGM / MGZ 050 - 064	HGM / HGZ 032 - 050	LGZ 044 - 050	1050	775	585	3 G
MGM / MGZ 080 - 160	HGM / HGZ 064 - 100	LGZ 088 - 100	1250	875	700	4 G
-	HGM / HGZ 125 - 160	-	1550	945	1000	5 G

REFRIGERATING CONNECTIONS

Only use clean, dehydrated copper refrigeration tubing.

The compressor pipework has to be flexible (pipe run in 3 directions or in a circular mode, or equipped with vibration absorbers).

It is important not to fasten the pipework too close to the compressor.

The refrigerating pipework must be as simple and as short as possible, avoid low points on pipework where oil could accumulate.

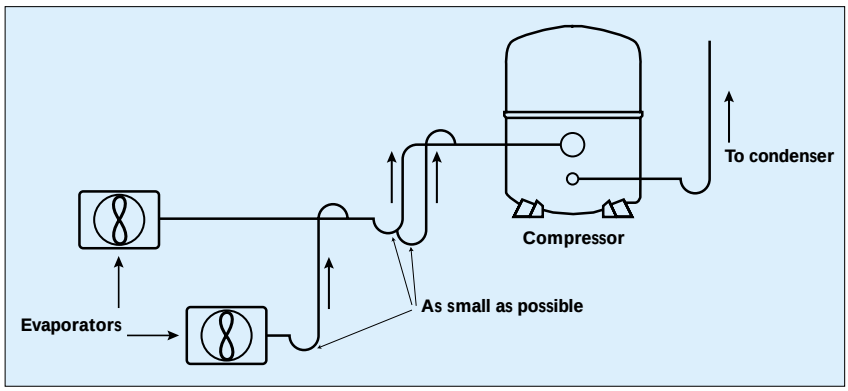
On suction line, horizontal sections shall be slopped downward towards the compressor.

The suction gas velocity must be sufficient to ensure a good oil return, between 8 and 12 m/s in vertical risers.

In horizontal pipes this velocity can decrease down to 4 m/s.

The use of U-trap and double suction risers are often required.

These suction risers must always be fitted with a U-trap at the bottom and a P-trap at the top and never be higher than 4 m unless a second U-trap system is fitted.



When the evaporator is installed above the compressor, suction line design shall be such liquid refrigerant will not floods back to the compressor during off cycle.
The suction line must always be insulated to avoid condensation and abnormal superheat.

Depending on the application the following values should be considered:
- evaporator superheat between 5 and 12K,
- suction gas superheat at compressor inlet 30 K maximum.

A too important superheat causes a rapid increase of the compressor discharge gas temperature which shall never be higher than 130°C.
For specific applications (multi evaporator system, long pipe runs,…) the use of an oil separator connected to the discharge side of the compressor is recommended.

SYSTEM CLEANLINESS

One of the main factors affecting equipment reliability and compressor service life is the refrigeration circuit contamination. During installation, circuit contamination could be caused by:

- Brazing and welding oxides,
- Filings and particles from de-burring pipe-work,
- Brazing flux,
- Moisture and air.

Consequently, the following precautions must be taken:

Pipework
Only use clean, dehydrated copper refrigeration tubing.

Avoid flare type connections and take great care when brazing.
Use only silver alloy rods.

Run in the braze without over-filling to insure it does not leak into the tube.

All brazing should be executed in an inert gas atmosphere (nitrogen or CO2) to prevent oxidation.

If flux is used, take every precaution to prevent leakage into the pipe-work.

Leak detection
Perform a leak detection of the system (except condensing unit) under nitrogen mixed with the refrigerant to be used in the system.

Maintain the liquid and suction shut off valves in closed position (unit leak tested in factory).

Do not use CFC for leak testing condensing unit which will be used with HFC refrigerants.

The use of leak detecting fluids is not recommended as they may interact with lubricant's own additives.

SYSTEM CLEANLINESS

System pressure test

When running a pressure test, use an inert, dry gas.

The pressure differential between high and low side shall not exceed 24 bar differential (350 psig). Maximum test pressures are:

- Low pressure side 25 bar (370 psig)
- High pressure side 33 bar (480 psig) (except unit fitted with 3 litres receiver for R22 operation)

Pull down under vacuum - moisture removal

Moisture prevents proper functioning of the compressor and the refrigeration system.

Air and moisture reduce service life and increase condensing pressure, which causes abnormally high discharge temperatures likely to destroy the oil's lubricating properties.

The risk of acid formation is also increased by air and moisture, and copper plating can be generated in this way.

All these phenomena, can cause mechanical and electrical compressor failures.

The usual method of avoiding these problems is vacuum pull-down executed with a vacuum pump creating a minimum vacuum of 250 microns (0,33 mbar).

Do not open the unit shut-off valves before the refrigeration circuit is fully dehydrated.

LUBRICANT

Three types of lubricants are used:
- mineral oil 160P for MGM and HGM
- ester oil 160PZ for MGZ and HGZ
- ester oil 160Z for LGZ

Models	Oil type	1 litre can ref.	2 litre can ref.	5 litre can ref.
MGM - HGM	Mineral 160 P	-	7754001	7754002
MGZ - HGZ	Ester 160 PZ	7754019	7754020	-
LGZ	Ester 160 Z	7754023	7754024	-

The condensing unit compressor is supplied with an initial oil charge (refer to part 3 of this document).

On delivery the oil level can be checked through compressor sight glass.

Although this initial oil charge is sufficient for standard applications, it is important to check the oil level during the start-up period.

During this starting procedure no oil addition is required except when oil level is no longer visible in the sight glass.

When the compressor is running smoothly at stabilised conditions the oil level must be between 1/2 and 3/4 of the oil sight glass.

Liquid refrigerant in the compressor sump at start-up may give wrong oil level indication.

Operating limits and safeties

REFRIGERANT CHARGE LIMITS

The refrigerant charge limit for Maneurop® reciprocating compressors is 2,5 kg per cylinder.

According to the size of compressors fitted on condensing units, the following table shall be used to evaluate if additional precautions are required:

Condensing units models			Compressor	Refrigerant charge limit (kg)
MGM / MGZ 018 - 040	**HGM / HGZ 018 - 040**	**LGZ 022 - 028**	1 cyl.	2.5
MGM / MGZ 050 - 080	**HGM / HGZ 050 - 080**	**LGZ 044 - 050**	2 cyl.	5.0
MGM / MGZ 100 - 160	**HGM / HGZ 100 - 160**	**LGZ 088 - 100**	4 cyl.	10.0

Crankcase heater

Depending on the application, the refrigerant charge of the plant often exceeds the above mentioned values.
For this reason Bluestar condensing units are fitted with a crankcase heater.

This PTC heating element protects against off-cycle migration of refrigerant; but it is only effective if the oil temperature is maintained 11K above the saturated temperature of the refrigerant.

Tests must be conducted to insure that the appropriate oil temperature is maintained under all ambient conditions.

For refrigeration systems with an outdoor condensing unit installation under low ambient temperature or for low evaporating temperature systems with very important refrigerant charge; an additional belt type heater must be used to avoid refrigerant condensation in the compressor.
See below the references of these accessories.

On the initial start up or after a long shut down period the crankcase heater must be energized at least 12 hours before first start up.

During normal operation the crankcase heater must be permanently energized.

The following crankcase heaters can be delivered for each model of compressors.

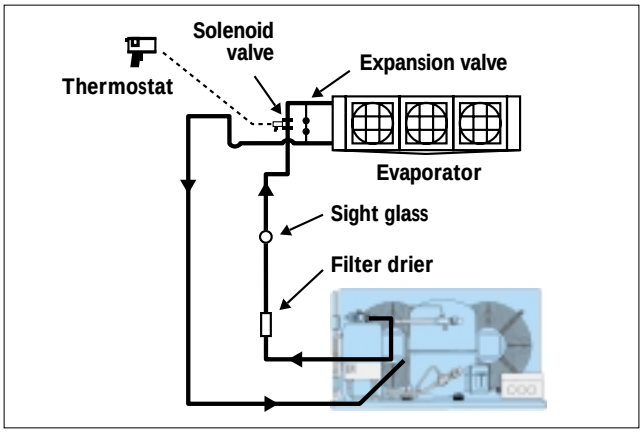
Condensing units models	Compressor types	PTC heater		Belt heater accessory	
		Type	Ref.	Type	Ref.
MGM / MGZ 018 - 040 HGM / HGZ 018 - 040 LGZ 022 - 028	1 cyl.	35 W 230 - 600 V	8156021	54 W 230 V	7773002
MGM / MGZ 050 - 080 HGM / HGZ 050 - 080 LGZ 044 - 050	2 cyl.			50 W 230 V	7773003
MGM / MGZ 100 - 160 HGM / HGZ 100 - 160 LGZ 088 - 100	4 cyl.			75 W 230 V	7773004

Suction accumulator

This component offers protection against refrigerant floodback during operation.
It helps protect against off-cycle migration by adding internal free volume to the low side of the system.
Tests must be conducted to insure the amount of off-cycle migration to the compressor does not exceed the compressor's charge limit in the table above.

Pump down cycle

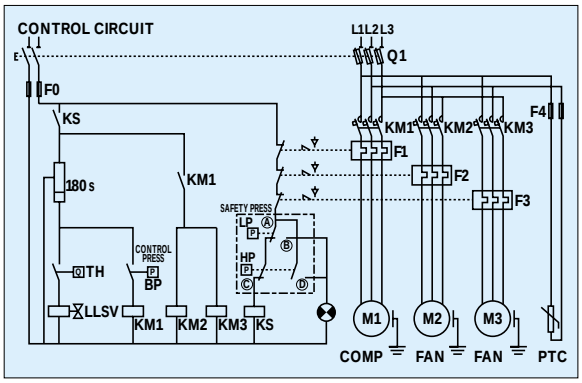
This is the most effective way to protect against off-cycle migration of liquid refrigerant.



Pump down sequence

The liquid solenoïd valve is controlled by a room thermostat. When the room temperature has fallen down to the thermostat setting point, the solenoïd valve will be closed.
The compressor will pump down and low pressure will decrease until the low pressure switch cut off set point, then the compressor will stop.
When using a pump down cycle the cut-in set point of the low pressure switch must be lower than the saturated pressure of the refrigerant corresponding to the lowest ambient temperature around evaporator and compressor.

◄*Typical cold room refrigeration circuit*



Suggested pump down control wiring

Legend:

Q1	power fused disconnect	**KM1**	compressor contactor
FO	control circuit fuses	**KM2-KM3**	fan contactor
F1	compressor overload protection	**KS**	safety devices
F2-F3	fan overload protection	**180s**	short cycle timer
F4	PTC fuses	**TH**	control (thermostat)
		LLSV	liquid line solenoid valve

SAFETY PRESSURE SWITCH SETTING

The Danfoss HP/LP pressure switch KP17W (automatic reset), or KP15 (manual reset), is not factory preset. Be sure that the high pressure setting will not exceed the receiver maximum service pressure.

High pressure safety

The high pressure safety switch is required to stop the compressor, should the discharge pressure exceed the values shown in the following table. The high pressure switch can be set to lower values depending on the application and ambient conditions.

The HP switch must either be in a lockout circuit or be a manual reset device (KP15) to prevent short cycling on its high pressure limit.

Refrigerant	R22	R134a	R404A
Setting (bar g.)	28*	20.2	28
Setting (psig)	400	300	400

* *Except MGM / HGM unit with 3 litres receivers: 25 bar, 360 Psig*

Low pressure safety

The low pressure safety switch protects the compressor against deep vacuum operation, a potential cause of failure due to internal arcing.
The low pressure safety cut-out shall never be set below 0.1 bar relative (2 psig).
For systems without pump-down, the LP switch signal contact shall be used to energize a low pressure safety alarm.

Suggested high and low pressure safety switch setting

Depending on the application and ambient conditions the following set point values could be used.

Models	Refrigerant	Low pressure side		High pressure side	
		Cut in (bar)	Cut off (bar)	Cut in (bar)	Cut off (bar)
MGM - HGM	**R22**	2	1	21	25
MGZ - HGZ	**R134a**	1.2	0.4	14	18
	R404A / R507	1.2	0.5	24	28
LGZ	**R404A / R507**	1	0.1	24	28

Condensing pressure control

The double fan condenser design makes condensing pressure control easy.
A high pressure control pressurestat (type KP 5 Danfoss) could be used for starting and stopping fans to prevent a wide fluctuation of the condensing temperature.
Continuous fans speed control is an alternate method for maintening constant condensing temperature under fluctuating ambient.
This will also improve compressor operational reliability, noise level and energy consumption.

Both single and three phase fan motors used in Bluestar units are suitable for speed control.
Fan speed controllers usually use the voltage feed to the motor to control its speed as a function of the condensing temperature or pressure.

CYCLE RATE LIMIT

There must be no more than 12 starts per hour. A higher number reduces the service life of the motor-compressor unit.

If necessary, use an anti-short-cycle timer in the control circuit.
A three-minutes time-out is recommended.

When a soft start equipment is used the maximum number of start shall not exceed 6 / hour.

SOUND LEVEL

Bluestar condensing units are engineered for low sound and vibration characteristics with a compact condenser and two fans construction.
The table below gives the unit sound level.

For extra low sound system requirements compressor acoustic hood could be used to further dampen compressor sound. These accessory covers incorporate sound proofing materials and achieve excellent high and low frequency attenuation in the range of 6 to 8 dB(A). These acoustic hoods are of the quick and easy fit-on type and do not excessively increase the overall size of the compressor.

Models	Sound power level measured LWA (dBA)	Sound pressure level calculated 2 m (dBA)	Compressor type	Acoustic hood ref.
MGM / MGZ 018	75.9	58.9		
MGM / MGZ 022	73.7	56.7		
MGM / MGZ 028	82.1	65.1	1 cyl.	7755001
MGM / MGZ 032 - 036	82.2	65.2		
MGM / MGZ 040	82.1	65.1		
MGM / MGZ 050	84.9	67.9		
MGM / MGZ 064	84.5	67.5	2 cyl.	7755002
MGM / MGZ 080	92.1	75.1		
MGM / MGZ 100	92.5	75.5	4 cyl.	7755003
MGM / MGZ 125 - 160	92.8	75.8		
HGM / HGZ 018	75.9	58.9		
HGM / HGZ 022	82.5	65.5		
HGM / HGZ 028	82.1	65.1	1 cyl.	7755001
HGM / HGZ 032 - 036	84	67		
HGZ / HGZ 040	83.9	66.9		
HGM / HGZ 050	84.9	67.9		
HGM / HGZ 064	92	75	2 cyl.	7755002
HGM / HGZ 080	92.1	75.1		
HGM / HGZ 100	92.5	75.5	4 cyl.	7755003
HGM / HGZ 125 - 160	92.8	75.8		
LGZ 022	73.9	56.9	1 cyl.	7755001
LGZ 028	83.2	66.2		
LGZ 044	87.4	70.4	2 cyl.	7755002
LGZ 050				
LGZ 088	92.9	75.9	4 cyl.	7755003
LGZ 100	93	76		

Performance data tables are based on Ari conditions:

Evaporating temperature: 7.2 °C
Condensing temperature: 54.4 °C
Superheat: 11.1 K

Compressor motor code 4:
460 V / 3 / 60 Hz

For further technical details, refer to Danfoss Maneurop Technical information n°051, or contact Danfoss Maneurop sales organisation

The Bluestar condensing units assembly lines

France

USA

China

India

New Zealand

Brazil

The Danfoss Maneurop facilities

Anse
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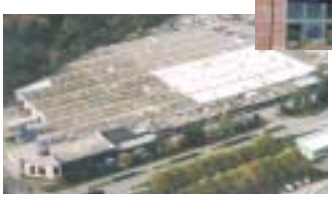
Lawrenceville
Georgia - USA



Trévoux
France

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