

**ULT - ready**

**Model**

Designation	<b>MS21UDULTM</b>	220-240V/50Hz 1~	Sales code:	<b>104M0811</b>
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**Compressor design**

Oil type	Polyolester	Refrigerant(s)	<b>R170, R508B</b>
Oil viscosity	32cST	Displacement	20,95cm <sup>3</sup> / 1,28cu.in
Oil quantity	620cm <sup>3</sup> / 21fl.oz	Compressors on pallet	80
Refr. charge - tech. limit	500g / 17,6oz		
Free gas volume comp.	1460cm <sup>3</sup> / 49,4fl.oz		
Weight	14,2kg / 31,3lbs		
Motor protection	external		
Winding resistance main	4,09Ω (at 25°C)		
Winding resistance aux	13,46Ω (at 25°C)		
Max. winding temp.	135°C / 275°F		
Max. discharge temp.	140°C / 284°F		



**General - Configurations with MS21UDULTM**

	<b>Conf. 1</b>
Motorconfiguration	CSCR
Power supply (nominal)	220-240V/50Hz
Number of phases	1
Voltage range	198-254V
Approvals	Chem.-comp.
Starting torque	HST
Note	ULT-ready. Compressor for low-temp-stage of cascade refrigeration systems.

**Applications with MS21UDULTM**

	<b>Conf. 1</b>
Refrigerant	R170
Application	LBP
System cooling	fan 3m/s
Hot gas defrost	-/-
Long interval pull down	-/-

**Electrical data - Configurations with MS21UDULTM**

	<b>Conf. 1</b>
Starting device type	relay
Run capacitor	10μF
Start capacitor	60μF
LRA (locked rotor amps / 4s)	18,16A
RLA (rated load amps / 1s)	2,95A
Cut in current	18,16A

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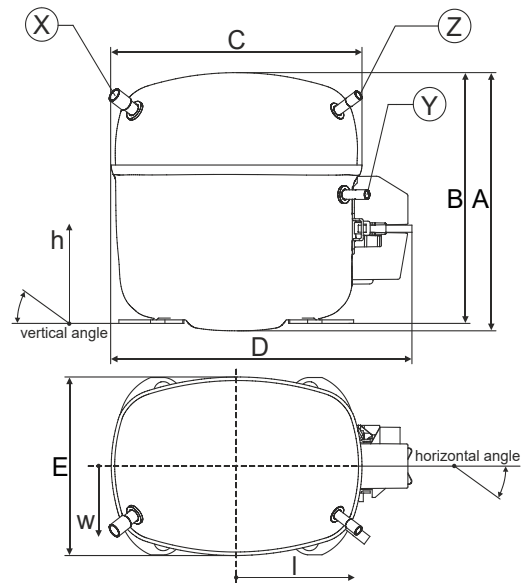
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Designation **MS21UDULTM** 220-240V/50Hz 1~

Sales code: **104M0811**

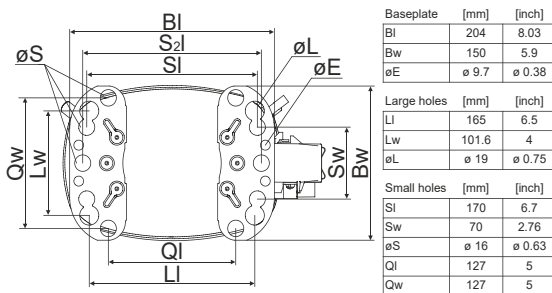
**Compressor dimensions**

<b>Housing</b>	A Height	219mm / 8,62in
	B Height	213mm / 8,39in
	C Length shell	218mm / 8,58in
	D Length w. cover	255mm / 10,04in
	E Width	151mm / 5,94in

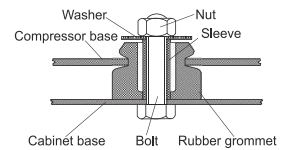


<b>Connectors</b>		<b>Suction</b>	<b>Discharge</b>	<b>Process</b>
		<b>X</b>	<b>Y</b>	<b>Z</b>
Diameter	[mm]	øi 10,11-10,29	øi 6,11-6,29	øi 6,11-6,29
(i:inside, o:outside)	[in]	øi 0,4-0,41	øi 0,24-0,25	øi 0,24-0,25
Material		copper	copper	copper
Horizontal angle	±2°	37°	37°	143°
Vertical angle	±2°	30°	0°	150°
Position l/h/w	[mm]	107/193/55	115/110/63	-107/193/55
	[in]	4,2/7,6/2,2	4,5/4,3/2,5	-4,2/7,6/2,2
Straight tube l.	[mm]	12	12	12
	[in]	0,5	0,5	0,5

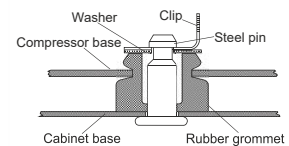
**Compressor fixation**



**Bolt joint**



**Snap-on**



**Mounting accessories**

	one comp.	multi pack
Bolt joint   M6   ø16mm	118-1917	118-1918
Bolt joint   ø1/4"   ø16mm	118-1946	
Bolt joint   ø1/4"   ø19mm	118-1949	
Snap-on   ø7,3   ø16mm	118-1947	118-1919

**Application notes**

ULT-ready. Compressor for low-temp-stage of cascade refrigeration systems.

No warranty if compressor operated relevant time outside of published operation limits.

Contact SECOP-Sales to agree on warranty limits (depends on kind of application).

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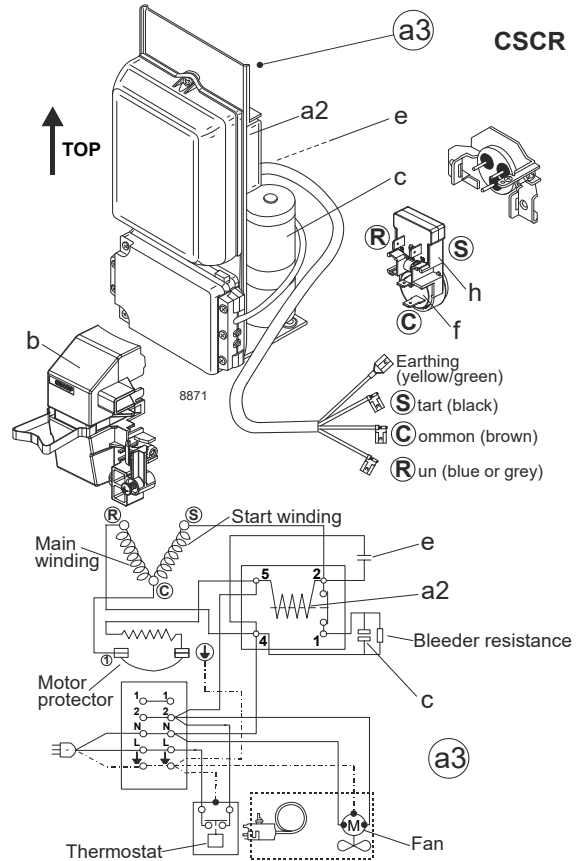
**Model**

Designation **MS21UDULTM 220-240V/50Hz** Conf. 1 Sales code: **104M0811**

**Configuration**

Motorconfiguration **CSCR**  
 Power supply (nominal) **220-240V/50Hz 1~**  
 Refrigerant **R170**  
 Application **LBP**  
 Voltage range **198-254V**  
 Starting torque **HST**  
 Approvals **Chem.-comp.**

**Electrical accessories / wiring diagram**

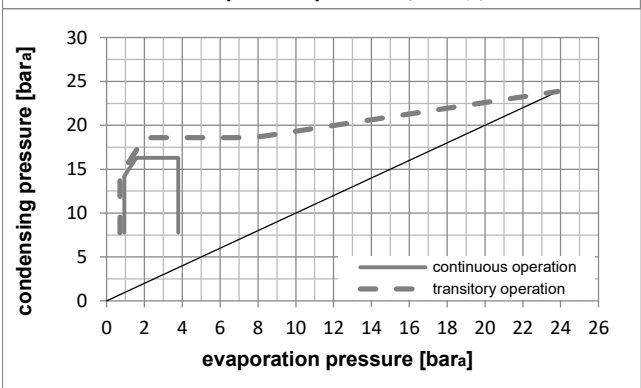
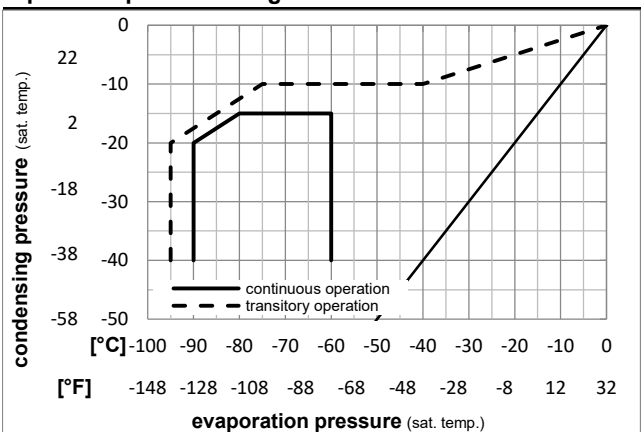


**Ambient temperatures / system cooling**

Ambient temperature min.: **10°C / 50°F**  
 Ambient temperature max.: **38°C / 101°F**

System cooling (n/a: outside limits)			
T ambient	LBP	MBP	HBP
32°C / 90°F	fan 3m/s	n/a	n/a
38°C / 100°F	fan 3m/s	n/a	n/a
43°C / 110°F	n/a	n/a	n/a

**Operation pressure range**



Components (protector + ~holder + cover: pre assembled)

- a3 SC starter kit (550mm) 117-7816
- f / h motor protector assy. (T1102) 117U8001
- b plastic cover 117U1028

Alternative comp. (protector + ~holder + cover: pre assemb.)

- a2 potential relay (RVA 4I3R A57) 117-7600
- e run capacitor (10µF, 6.3mm) 117-7112
- c start capacitor (60µF, 6.3mm) 117U5389
- f / h motor protector assy. (T1102) 117U8001
- b plastic cover 117U1028

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Model

Designation **MS21UDULTM 220-240V/50Hz** Conf. 1 Sales code: **104M0811**

Optimization + standard conditions

R170, 220V/50Hz, CSCR, fan 3m/s, Chem.-comp.

Evaporating pressure (saturation temperature)					Condensing pressure (saturation temperature)					Power consumption				
					Return gas temp.					Current consumption				
					Liquid temp.					Ref. mass flow				
Cooling capacity					COP		EER			P1	I	m		
pe	pc	RGT	Tliq	[W]	[Btu/h]	[kcal/h]	[W/W]	[Btu/Wh]	[kcal/Wh]	[W]	[A]	[kg/h]		
[°C]	-90	-15	-20	-15	226,2	773	194,7	0,83	2,83	0,71	273,1	1,51	2,07	1
[°F]	-130	5	-4	5										
[°C]	-90	-20	-20	-20	256,6	876	220,8	0,93	3,17	0,80	276,8	1,52	2,26	2
[°F]	-130	-4	-4	-4										
[°C]	-90	-25	-20	-25	288,8	986	248,5	1,05	3,58	0,90	275,6	1,52	2,45	3
[°F]	-130	-13	-4	-13										
[°C]	-90	-30	-20	-30	322,3	1101	277,4	1,19	4,08	1,03	269,8	1,49	2,65	4
[°F]	-130	-22	-4	-22										
[°C]	-90	-35	-20	-35	356,4	1217	306,7	1,37	4,69	1,18	259,5	1,45	2,83	5
[°F]	-130	-31	-4	-31										
[°C]	-90	-40	-20	-40	390,6	1334	336,2	1,60	5,45	1,37	244,9	1,40	3,01	6
[°F]	-130	-40	-4	-40										

Performance tables

R170, 220V/50Hz, CSCR, fan 3m/s, Chem.-comp.

	pe	Cooling capacity			COP		EER		P1	I	m
	[°C]	[°F]	[W]	[Btu/h]	[kcal/h]	[W/W]	[Btu/Wh]	[kcal/Wh]	[W]	[A]	[kg/h]
[°C / °F]	-90	-130	288,8	986	248,5	1,05	3,58	0,90	275,6	1,52	2,45
cond. pressure	-85	-121	426,1	1455	366,7	1,29	4,40	1,11	331,1	1,73	3,62
pc= -25/-13	-80	-112	596,0	2036	512,9	1,54	5,26	1,33	386,7	1,96	5,08
return gas temp.	-75	-103	802,4	2740	690,5	1,82	6,22	1,57	440,5	2,19	6,86
RGT= -20/-4	-70	-94	1048,7	3582	902,5	2,14	7,30	1,84	490,6	2,41	9,00
liquid temp	-65	-85	1338,6	4571	1152,0	2,50	8,54	2,15	535,1	2,61	11,53
Tliq= -25/-13	-60	-76	1675,2	5721	1441,7	2,93	10,00	2,52	572,1	2,77	14,49
[°C / °F]	-90	-130	356,4	1217	306,7	1,37	4,69	1,18	259,5	1,45	2,83
cond. pressure	-85	-121	502,8	1717	432,8	1,65	5,63	1,42	305,1	1,63	4,00
pc= -35/-31	-80	-112	684,4	2337	589,0	1,97	6,72	1,69	348,1	1,80	5,46
return gas temp	-75	-103	904,9	3090	778,8	2,34	8,00	2,02	386,4	1,96	7,24
RGT= -20/-4	-70	-94	1168,0	3989	1005,2	2,79	9,54	2,40	418,2	2,10	9,37
liquid temp	-65	-85	1477,2	5045	1271,3	3,34	11,42	2,88	441,6	2,20	11,89
Tliq= -35/-31	-60	-76	1835,9	6270	1580,0	4,04	13,79	3,47	454,7	2,25	14,85

<b>Model</b>	<b>ULT - ready</b>	
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**Application note**

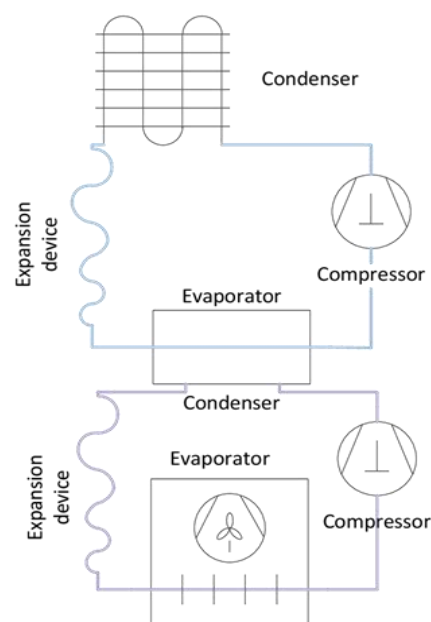
This compressor is designed for operation inside the low-temperature-stage of a two stage refrigeration cascade. Use of various refrigerants and refrigerant-mixtures is possible but it must be ensured that the pressure limits shown on the pages before are not exceeded.

Operation outside of the published operation limits (pressures, temperatures, compressor cooling, voltage range) may lead to serious overloading of motor protector and starting equipment and must be avoided. In case of frequent overloading defects of relays, capacitors or motor protectors can occur.

To avoid overloading (or to keep it on the lowest possible level) adjust size of heat-exchangers, temperature of intercooler, and on-off control of compressors and fans.

**Please also read design recommendations for ULT cabinets:**

<https://www.secop.com/ult>



**ULT - ready compressors**

These compressors allow operation with various refrigerants. Chemical compatibility (UL) is proven for R170. Motor and motor-protector are adjusted for safe and reliable operation inside the published operation limits. Extra-robust starting equipment is used but unfortunate performance regulation of the high-temperature-stage may create serious overloading of the second stage during starting. Compressors are proven reliable by internal SECOP testing (running inside given operation limits).

**Warranty**

Since design and regulation-strategy of the two stage cascade significantly define overloading of the compressor in the low-temperature-stage SECOP can't give universal warranty. Conditional warranty can be given in cases of joined (cabinet producer & SECOP) testing and approval. No liability in case of design changes like: use of different oil, use of different starting equipment or motor protector. No warranty if operated relevant time outside of published operation limits.