Model

Designation	**MP2UVULTM**	Sales code:	**101M0800**

Compressor design

Oil type	Polyolester	Refrigerant(s)	**R170, R508B**
Oil viscosity	15cST	Displacement	2cm³ / 0,12cu.in
Oil quantity	150cm³ / 5,1fl.oz	Compressors on pallet	150
Refr. charge - tech. limit	300g / 10,6oz		
Free gas volume comp.	870cm³ / 29,4fl.oz		
Compressor Weight	4,3kg / 9,5lbs		
Motor protection	external		
Winding resist. ph. to ph.	1,8Ω (at 25°C)		
Max. winding temp.	125°C / 257°F		
Max. discharge temp.	130°C / 266°F		

General - Configurations and Applications with MP2UVULTM and Controller

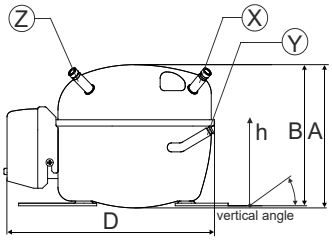
	Conf. 1
Sales code single pack:	101NULT1
Sales code industry pack:	101NULT2
Power supply (nominal)	12/24V
Approvals	UL/ CB
Refrigerant	R170
Number of phases	DC
Application	LBP
Starting torque	LST
System cooling	static
Note	- / -

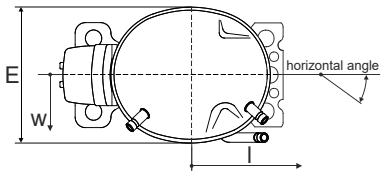
Model

Designation **MP2UVULTM** Sales code: **101M0800**

Compressor dimensions

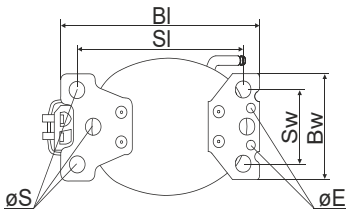
Housing	A Height	137mm / 5,39in
	B Height	135mm / 5,31in
	C Length shell	176mm / 6,93in
	D Length w. cover	206mm / 8,11in
	E Width	130mm / 5,12in





Connectors		**Suction**	**Discharge**	**Process**
		X	**Y**	**Z**
Diameter	[mm]	øi 6,11-6,29	øi 5,12-5,26	øi 6,11-6,29
(i:inside, o:outside)	[in]	øi 0,24-0,25	øi 0,2-0,21	øi 0,24-0,25
Material		steel/CU	steel/CU	steel/CU
Horizontal angle	±2°	40°	0°	135°
Vertical angle	±2°	40°	21°	140°
Position l/h/w	[mm]	80/128/46	80/72/60	-47/125/50
	[in]	3,1/5/1,8	3,1/2,8/2,4	-1,9/4,9/2
Straight tube l.	[mm]	12	12	12
	[in]	0,5	0,5	0,5

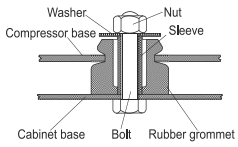
Compressor fixation



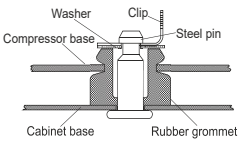
Baseplate	[mm]	[inch]
Bl	204	8.03
Bw	100	3.94
øE	ø 9	ø 0.35

Small holes	[mm]	[inch]
Sl	170	6.7
Sw	70	2.76
øS	ø 16	ø 0.63

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	
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).

Short term slanted position

The Compressor can be used up to °30 angle for short time.

Model

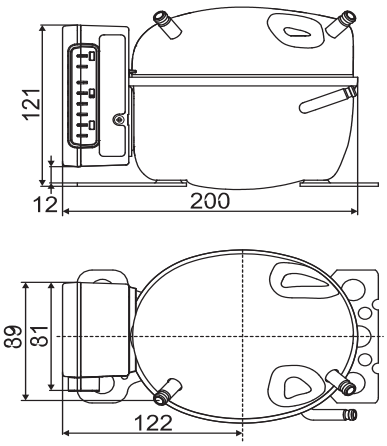
Designation	**MP2UVULTM**	**12/24V**	**Conf. 1**	Sales code:	**101M0800**

Controller	**ULT - High Speed**	**101NULT1**

Sales code single pack:	101NULT1 (1 units)
Sales code industry pack:	101NULT2 (30 units)
Adaption to compressor:	attached
Protection class:	IP20
Controller Weight:	0.32 kg / 0.704 lbs
Voltage nom.:	12/24V
Voltage range:	9,6-17/21,3-31,5 V
Compressor speed range:	2500-4400 rpm
Housing plastic:	UL94-V0
Approvals:	UL/ CB

QR Code and Hyperlink leads to the Operating Instructions.

Controller dimensions:

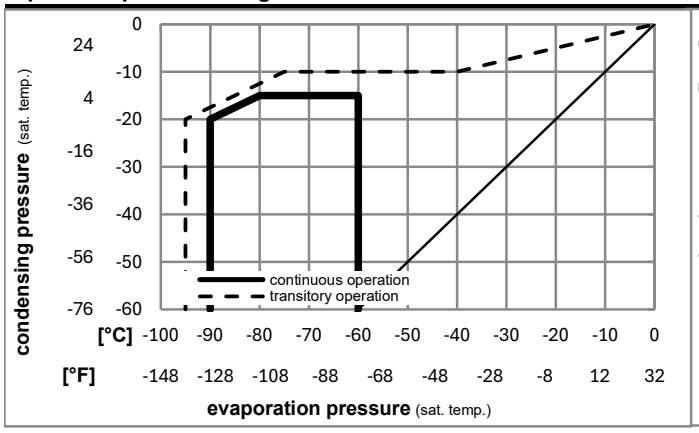


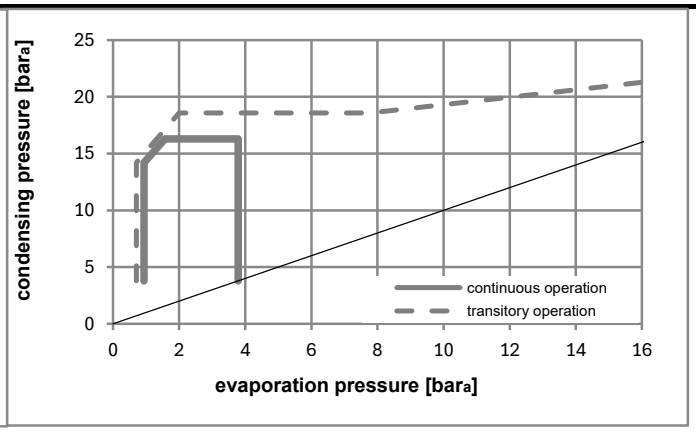
System cooling

Ambient/ machineroom temperatures minimum /maximum

Ambient temperature range:	10 - 43°C / 50 - 110°F
Machine room temperature range compressor:	10 - 48°C / 50 - 119°F
Machine room temperature range controller:	10 - 110°C / 50 - 230°F
Compressor and Controller Cooling:	Static cooling

Operation pressure range R170



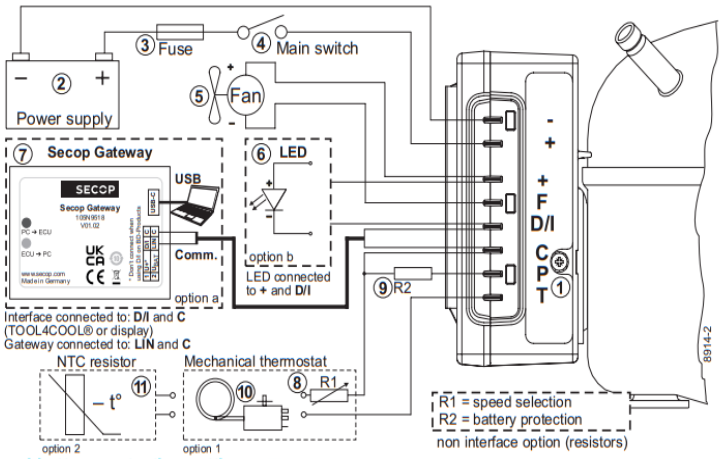


Model

Designation **MP2UVULTM 12/24V Conf. 1** Sales code: **101M0800**

Controller **ULT - High Speed** **101NULT1**

Fig. 1



Wire Dimensions DC

Size		Max. length*		Max. length*	
Cross section	AWG	12V operation		24V operation	
[mm²]	[Gauge]	[m]	[ft.]	[m]	[ft.]
6	10	2.5	8	5	16

*Length between battery and electronic unit

Fig. 2

Standard battery protection settings

12V cut-out [V]	12V cut-in [V]	24V cut-out [V]	24V cut-in [V]
10.4	11.7	22.8	24.2

Fig. 3

Optional battery protection settings Fig. 4

Resistor (R2) [kΩ]	12V cut-out [V]	12V cut-in [V]	12V max. [V]	24V cut-out [V]	24V cut-in [V]	24V max. [V]
0	9.6	10.9	17.0	21.3	22.7	31.5
1.6	9.7	11.0	17.0	21.5	22.9	31.5
2.4	9.9	11.1	17.0	21.8	23.2	31.5
3.6	10.0	11.3	17.0	22.0	23.4	31.5
4.7	10.1	11.4	17.0	22.3	23.7	31.5
6.2	10.2	11.5	17.0	22.5	23.9	31.5
11	10.5	11.8	17.0	23.0	24.5	31.5
14	10.6	11.9	17.0	23.3	24.7	31.5
18	10.8	12.0	17.0	23.6	25.0	31.5
24	10.9	12.2	17.0	23.8	25.2	31.5
33	11.0	12.3	17.0	24.1	25.5	31.5
47	11.1	12.4	17.0	24.3	25.7	31.5
82	11.3	12.5	17.0	24.6	26.0	31.5
220	9.6	10.9				31.5

Compressor speed

Electronit unit Code number	Resistor (R1) [Ω] calculated values	Motor speed [rpm]
101NULT5 with AEO	0	AEO
	203	2,500
	451	3,100
	867	3,800
	1700	4,400

Fig. 5

ENGLISH

The electronic unit is a dual voltage device. This means that the same unit can be used in both 12V and 24V power supply systems. Maximum voltage is 17V for a 12V system and 31.5V for a 24V power supply system. Max. ambient temperature is 55°C. The electronic unit has a built-in thermal protection which is actuated and stops compressor operation if the electronic unit temperature gets too high. The electronic unit is designed to be used in two stage cooling appliances as high temperature stage controller. Please refer to 101NULT3 as low temperature stage controller.

Installation (Fig.1)

Connect the terminal plug from the electronic unit to the compressor terminal. Mount the electronic unit on the compressor by snapping the cover over the screw head (1).

Power supply

The electronic unit must always be connected directly to the battery poles (2). The electronic unit is protected against reverse battery connection. A fuse (3) must be mounted in the **+** cable as close to the battery as possible. 30A fuse for 12V and 15A fuse for 24V circuits are recommended. If a main switch (4) is used, it should be rated to a current of min. 30A. The wire dimensions in **Fig. 2** must be observed. Avoid extra junctions in the power supply system to prevent voltage drop from affecting the batteryprotection setting.

Battery protection

The compressor stops and restarts according to the voltage measured on the **+** and **-** terminals of the electronic unit. The standard settings appear from **Fig. 3**. Other settings **(Fig. 4)** are optional if a R2 resistor (9) is connected between terminals **C** and **P**.

Thermostat and speed selection

Either an NTC (electrical thermostat, 11) or a mechanical thermostat (10) can be connected between the terminals **C** and **T**. If an NTC is used, the set point and speed can be set via a communication interface between terminals **C** and **D/I**. If a mechanical thermostat is used without any R1 resistor (8), the compressor will adjust its speed to the actual cooling demand (AEO mode). Other fixed compressor speeds in the range between 2,500 and 4,400 rpm can be obtained when a resistor (8) is installed to adjust the current (mA) of the control circuit. Resistor values for various motor speeds appear from **Fig. 5**.

Fan (optional)

A fan (5) can be connected between the terminals **+** and **F**. **A 12V fan must be used for both 12V and 24V power supply systems.**

The fan output can supply a continous current of **0.5A**$_{avg}$. A higher current draw is allowed for 2 seconds during start.

Protection against too many start attempts

The electronic is protected against too many start attempts. If more then ten starts occur in an unusual short time, the unit will blink with error code 2 and prevent further starts for 60s. After 60s normal operation will be resumed. A special ULT menu can be accessed via TOOL4COOL® and the minimum runtime and start count can be configured.

Communication interface (option a)

A PC can be connected through the *Secop Gateway* (7) to the communication interface between terminal **D/I** and **C**. The software TOOL4COOL® allows you to create different settings and reads out several measurements. Settings can be copied from one unit to another in mass production. Alternatively a customer specific controller (e.g. display) can be connected to adjust the settings like set point and speed during operation.

LED (option b)

A 10mA light emitting diode (LED) (6) can be connected between the terminals **+** and **D/I**. In case the electronic unit records an operational error, the diode will flash a number of times. The number of flashes depends on what kind of operational error was recorded. Each flash will last ¼ second. After the actual number of flashes there will be a delay with no flashes, so that the sequence for each error recording is repeated every 4 seconds.

Operational errors

Error code or LED flashes	Error type Can be read out in the software TOOL4COOL®
6	**Thermostat failure** (If the NTC thermistor is short-circuit or has no connection).
5	**Thermal cut-out of electronic unit** (If the refrigeration system has been too heavily loaded, or if the ambient temperature is high, the electronic unit will run too hot).
4	**Minimum motor speed error** (If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm).
3	**Motor start error** (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)).
2	**Too many start attempts or fan over current** (Too many compressor or fan starts in short time or fan current higher than 0.5A$_{avg}$).
1	**Battery protection cut-out** (The voltage is outside the cut-out setting).

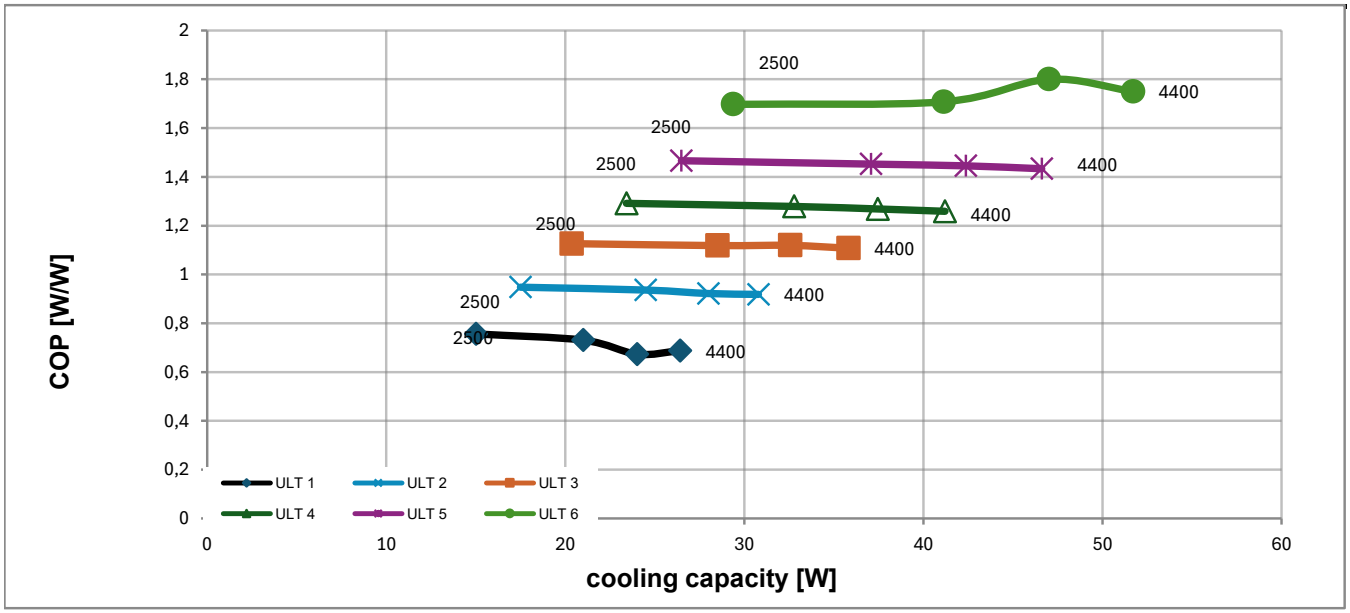
Model

Designation	MP2UVULTM	12/24V	Conf. 1	Sales code:	101M0800
Controller	**ULT - High Speed**				**101NULT1**

Optimization + standard conditions R170, 12V, Rpm_N 4400, static

	Evaporating pressure (saturation temperature)	Condensing pressure (saturation temperature)	Return gas temp.	Liquid temp.	Cooling capacity			COP	EER		Power consumption P1	Current consumption I	Ref. mass flow ṁ	
	pe	pc	RGT	Tliq	[W]	[Btu/h]	[kcal/h]	[W/W]	[Btu/Wh]	[kcal/Wh]	[W]	[A]	[kg/h]	
[°C]	-90	-15	10	-15	26,4	90	22,7	0,69	2,35	0,59	38,4	1,48	0,21	**ULT 1**
[°F]	-130	5	50	5										
[°C]	-90	-20	10	-20	30,8	105	26,5	0,92	3,14	0,79	33,5	1,45	0,24	**ULT 2**
[°F]	-130	-4	50	-4										
[°C]	-90	-25	10	-25	35,8	122	30,8	1,11	3,78	0,95	32,3	1,43	0,27	**ULT 3**
[°F]	-130	-13	50	-13										
[°C]	-90	-30	10	-30	41,2	141	35,5	1,26	4,30	1,08	32,7	1,42	0,30	**ULT 4**
[°F]	-130	-22	50	-22										
[°C]	-90	-35	10	-35	46,6	159	40,1	1,43	4,90	1,23	32,5	1,43	0,33	**ULT 5**
[°F]	-130	-31	50	-31										
[°C]	-90	-40	10	-40	51,7	177	44,5	1,75	5,98	1,51	29,5	1,49	0,36	**ULT 6**
[°F]	-130	-40	50	-40										

Standard conditions with different RPM R170, 12V, static



Test conditions:	pe [°C]	pc [°C]	Tliq [°C]	Tsuc [°C]
ULT 1	-90	-15	-15	10
ULT 2	-90	-20	-20	10
ULT 3	-90	-25	-25	10
ULT 4	-90	-30	-30	10
ULT 5	-90	-35	-35	10
ULT 6	-90	-40	-40	10