

**Type: Hermetic piston compressors**

**Producer: Maneurop**

**Series: MTZ**

## **Model: MTZ40**

### **Technical data**

Cylinder count:	1
Displacement [m <sup>3</sup> /h]:	11,81
Cylinder capacity [cm <sup>3</sup> ]:	67,9
RPM [min <sup>-1</sup> ]:	2900
Weight [kg]:	26
Oil charge [dm <sup>3</sup> ]:	1
Oil type:	160PZ
Crankcase heater type:	PTC 35 W
Maximum system test pressure low side / high side:	25 / 30
Maximum number of starts without softstart [1/h]:	12
Refrigerant charge limit [dm <sup>3</sup> ]:	3
Refrigerant:	R134a, 404A/R507, R407C
Sound power [dB]:	70
Sound power with acoustic hood [dB]:	65

### **Connections**

	<u>milimeters</u>	<u>inches</u>
Suction Rotolock valve connection:		1 1/4"
Discharge Rotolock valve connection:		1"
Suction connection with supplied sleeve:		5/8"
Discharge connection with supplied sleeve:		1/2"

### **Approvals**

CCC	+
CE	+
UL	+

R134a

**Cooling capacity [W]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>
<b>35</b>	3 068	3 907	4 891	6 034	7 351	8 856	10 563	12 488
<b>40</b>	2 878	3 689	4 637	5 738	7 006	8 454	10 099	11 953
<b>45</b>	2 680	3 458	4 367	5 421	6 635	8 023	9 600	11 380
<b>50</b>	2 474	3 214	4 079	5 082	6 238	7 561	9 066	10 767
<b>55</b>	2 256	2 955	3 771	4 718	5 811	7 064	8 493	10 111
<b>60</b>	-	2 677	3 440	4 327	5 353	6 533	7 880	9 411
<b>65</b>	-	-	-	3 907	4 862	5 963	7 225	8 664
<b>70</b>	-	-	-	-	-	5 354	6 526	7 868
<b>75</b>	-	-	-	-	-	-	5 781	7 021

**Power input [W]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>
<b>35</b>	1 325	1 445	1 555	1 653	1 733	1 791	1 824	1 827
<b>40</b>	1 400	1 531	1 656	1 771	1 872	1 954	2 013	2 046
<b>45</b>	1 465	1 610	1 752	1 887	2 010	2 118	2 205	2 269
<b>50</b>	1 520	1 681	1 842	1 998	2 145	2 280	2 398	2 495
<b>55</b>	1 564	1 742	1 923	2 103	2 276	2 440	2 590	2 722
<b>60</b>	-	1 791	1 995	2 200	2 402	2 597	2 780	2 949
<b>65</b>	-	-	-	2 287	2 519	2 747	2 967	3 174
<b>70</b>	-	-	-	-	-	2 891	3 149	3 397
<b>75</b>	-	-	-	-	-	-	3 324	3 614

**Current [A]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>
<b>35</b>	3.51	3.65	3.79	3.91	4.01	4.10	4.16	4.20
<b>40</b>	3.57	3.73	3.89	4.04	4.19	4.31	4.43	4.52
<b>45</b>	3.62	3.81	4.00	4.19	4.37	4.55	4.71	4.86
<b>50</b>	3.68	3.90	4.12	4.35	4.58	4.80	5.02	5.23
<b>55</b>	3.74	3.99	4.25	4.52	4.80	5.08	5.35	5.62
<b>60</b>	-	4.08	4.39	4.70	5.03	5.37	5.71	6.05
<b>65</b>	-	-	-	4.90	5.28	5.68	6.08	6.49
<b>70</b>	-	-	-	-	-	6.01	6.48	6.97
<b>75</b>	-	-	-	-	-	-	6.91	7.47

**Mass flow [kg/s]**

$t_c \setminus t_e$	-15	-10	-5	0	5	10	15	20
35	68.25	85.22	104.60	126.60	151.43	179.29	210.38	244.91
40	67.05	84.16	103.66	125.74	150.61	178.47	209.52	243.98
45	65.51	82.71	102.25	124.33	149.17	176.96	207.90	242.21
50	63.63	80.83	100.34	122.36	147.09	174.74	205.50	239.59
55	61.37	78.51	97.92	119.80	144.35	171.78	202.29	236.09
60	-	75.73	94.96	116.63	140.93	168.07	198.26	231.69
65	-	-	-	112.82	136.80	163.59	193.38	226.37
70	-	-	-	-	-	158.30	187.62	220.11
75	-	-	-	-	-	-	180.98	212.89

**C.O.P. [W/W]**

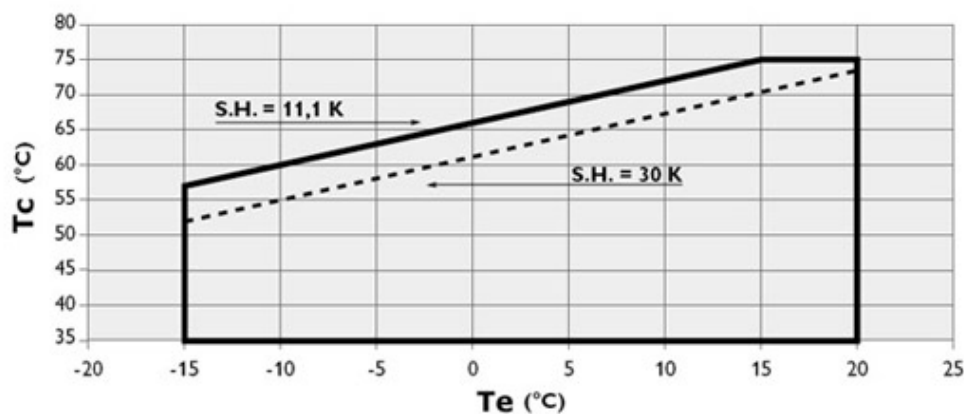
$t_c \setminus t_e$	-15	-10	-5	0	5	10	15	20
35	2.31	2.70	3.15	3.65	4.24	4.94	5.79	6.83
40	2.06	2.41	2.80	3.24	3.74	4.33	5.02	5.84
45	1.83	2.15	2.49	2.87	3.30	3.79	4.35	5.02
50	1.63	1.91	2.21	2.54	2.91	3.32	3.78	4.32
55	1.44	1.70	1.96	2.24	2.55	2.89	3.28	3.71
60	-	1.49	1.72	1.97	2.23	2.52	2.83	3.19
65	-	-	-	1.71	1.93	2.17	2.44	2.73
70	-	-	-	-	-	1.85	2.07	2.32
75	-	-	-	-	-	-	1.74	1.94

Operating conditions: suction superheat: 11.1 K, subcooling: 8.3 K

$t_c$  - Condensing temperature [°C]

$t_e$  - Evaporating temperature [°C]

**Application range**



R404A/R507

**Cooling capacity [W]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-30</b>	<b>-25</b>	<b>-20</b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>
<b>30</b>	2 448	3 330	4 396	5 669	7 172	8 925	10 953	13 277	15 919
<b>35</b>	2 168	2 997	3 993	5 177	6 573	8 202	10 087	12 250	14 713
<b>40</b>	1 885	2 659	3 581	4 674	5 959	7 461	9 200	11 200	13 482
<b>45</b>	1 601	2 316	3 161	4 159	5 333	6 704	8 294	10 128	12 225
<b>50</b>	1 314	1 968	2 734	3 635	4 693	5 930	7 370	9 033	10 944
<b>55</b>	-	1 616	2 300	3 101	4 040	5 141	6 427	7 918	9 638
<b>60</b>	-	1 262	1 860	2 557	3 376	4 338	5 466	6 782	8 308

**Power input [W]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-30</b>	<b>-25</b>	<b>-20</b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>
<b>30</b>	1 685	1 940	2 176	2 393	2 590	2 766	2 921	3 056	3 169
<b>35</b>	1 696	1 977	2 237	2 477	2 697	2 896	3 073	3 229	3 363
<b>40</b>	1 703	2 013	2 302	2 571	2 818	3 043	3 247	3 429	3 587
<b>45</b>	1 702	2 046	2 368	2 669	2 948	3 205	3 439	3 650	3 839
<b>50</b>	1 689	2 070	2 430	2 767	3 083	3 375	3 644	3 890	4 112
<b>55</b>	-	2 082	2 483	2 862	3 218	3 550	3 859	4 144	4 404
<b>60</b>	-	2 077	2 524	2 949	3 349	3 726	4 079	4 406	4 709

**Current [A]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-30</b>	<b>-25</b>	<b>-20</b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>
<b>30</b>	4.20	4.48	4.76	5.03	5.29	5.52	5.71	5.87	5.98
<b>35</b>	4.26	4.58	4.89	5.20	5.49	5.76	6.00	6.21	6.36
<b>40</b>	4.29	4.64	5.00	5.35	5.68	6.00	6.29	6.55	6.76
<b>45</b>	4.29	4.69	5.09	5.48	5.87	6.24	6.59	6.90	7.17
<b>50</b>	4.27	4.71	5.16	5.62	6.06	6.49	6.89	7.27	7.61
<b>55</b>	-	4.73	5.24	5.75	6.25	6.75	7.22	7.66	8.07
<b>60</b>	-	4.74	5.31	5.88	6.46	7.02	7.57	8.09	8.57

**Mass flow [kg/s]**

$t_c \setminus t_e$	-30	-25	-20	-15	-10	-5	0	5	10
<b>30</b>	77.06	102.46	131.80	165.60	204.35	248.56	298.74	355.38	418.98
<b>35</b>	73.41	98.94	128.20	161.70	199.94	243.42	292.65	348.14	410.37
<b>40</b>	69.20	94.83	123.99	157.16	194.86	237.60	285.86	340.16	401.00
<b>45</b>	64.38	90.09	119.10	151.93	189.07	231.02	278.29	331.38	390.80
<b>50</b>	58.86	84.63	113.48	145.93	182.48	223.63	269.88	321.74	379.71
<b>55</b>	-	78.38	107.05	139.10	175.03	215.35	260.56	311.16	367.65
<b>60</b>	-	71.29	99.75	131.37	166.66	206.12	250.26	299.57	354.57

**C.O.P. [W/W]**

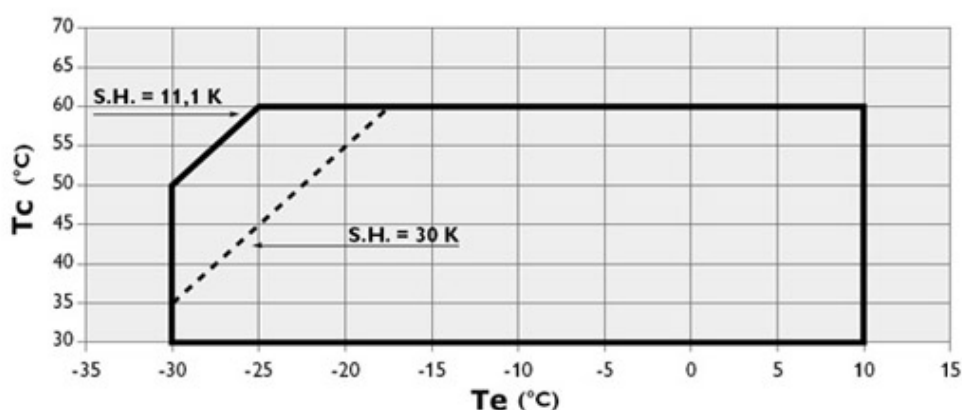
$t_c \setminus t_e$	-30	-25	-20	-15	-10	-5	0	5	10
<b>30</b>	1.45	1.72	2.02	2.37	2.77	3.23	3.75	4.34	5.02
<b>35</b>	1.28	1.52	1.78	2.09	2.44	2.83	3.28	3.79	4.38
<b>40</b>	1.11	1.32	1.56	1.82	2.11	2.45	2.83	3.27	3.76
<b>45</b>	0.94	1.13	1.33	1.56	1.81	2.09	2.41	2.77	3.18
<b>50</b>	0.78	0.95	1.13	1.31	1.52	1.76	2.02	2.32	2.66
<b>55</b>	-	0.78	0.93	1.08	1.26	1.45	1.67	1.91	2.19
<b>60</b>	-	0.61	0.74	0.87	1.01	1.16	1.34	1.54	1.76

Operating conditions: suction superheat: 10 K, subcooling: 0 K

$t_c$  - Condensing temperature [°C]

$t_e$  - Evaporating temperature [°C]

**Application range**



R407C

**Cooling capacity [W]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>
<b>35</b>	4 283	5 574	7 096	8 876	10 939	13 312	16 019
<b>40</b>	3 928	5 152	6 585	8 252	10 179	12 392	14 916
<b>45</b>	3 557	4 719	6 067	7 625	9 420	11 477	13 822
<b>50</b>	-	4 271	5 537	6 991	8 658	10 564	12 734
<b>55</b>	-	-	4 992	6 345	7 889	9 647	11 647
<b>60</b>	-	-	-	5 683	7 108	8 723	10 556
<b>65</b>	-	-	-	5 001	6 310	7 787	9 458

**Power input [W]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>
<b>35</b>	2 036	2 254	2 445	2 609	2 746	2 854	2 935
<b>40</b>	2 119	2 373	2 597	2 793	2 959	3 094	3 198
<b>45</b>	2 182	2 479	2 744	2 977	3 179	3 348	3 483
<b>50</b>	-	2 567	2 879	3 158	3 402	3 611	3 785
<b>55</b>	-	-	2 999	3 330	3 624	3 880	4 099
<b>60</b>	-	-	-	3 489	3 840	4 150	4 420
<b>65</b>	-	-	-	3 632	4 045	4 417	4 746

**Current [A]**

<b>t<sub>c</sub> \ t<sub>e</sub></b>	<b>-15</b>	<b>-10</b>	<b>-5</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>
<b>35</b>	4.68	4.93	5.15	5.34	5.51	5.64	5.73
<b>40</b>	4.78	5.08	5.36	5.60	5.81	5.98	6.11
<b>45</b>	4.85	5.22	5.56	5.86	6.13	6.35	6.52
<b>50</b>	-	5.34	5.76	6.13	6.46	6.74	6.98
<b>55</b>	-	-	5.94	6.39	6.80	7.16	7.47
<b>60</b>	-	-	-	6.64	7.14	7.59	7.98
<b>65</b>	-	-	-	6.88	7.48	8.02	8.51

**Mass flow [kg/s]**

$t_c \setminus t_e$	-15	-10	-5	0	5	10	15
35	92.95	118.94	148.95	183.38	222.67	267.23	317.49
40	89.63	115.51	145.12	178.87	217.19	260.51	309.24
45	85.74	111.61	140.91	174.08	211.53	253.69	300.98
50	-	107.06	136.16	168.84	205.51	246.62	292.56
55	-	-	130.70	162.98	198.98	239.12	283.83
60	-	-	-	156.35	191.77	231.05	274.60
65	-	-	-	148.78	183.72	222.22	264.72

**C.O.P. [W/W]**

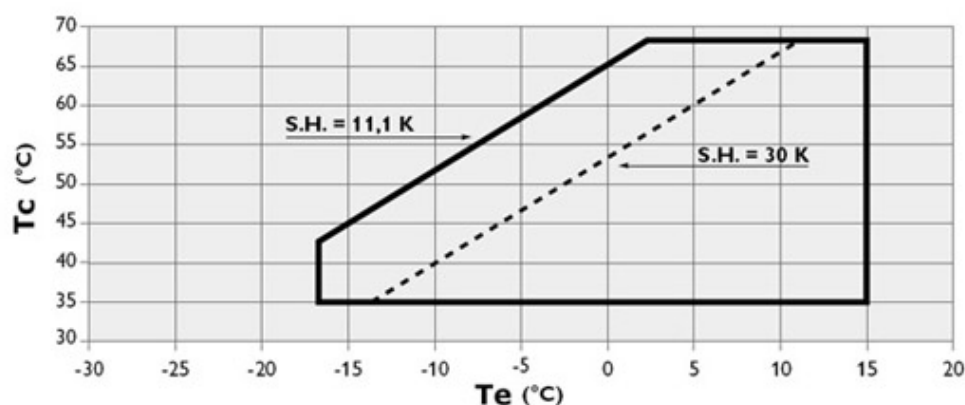
$t_c \setminus t_e$	-15	-10	-5	0	5	10	15
35	2.10	2.47	2.90	3.40	3.98	4.66	5.46
40	1.85	2.17	2.54	2.95	3.44	4.01	4.66
45	1.63	1.90	2.21	2.56	2.96	3.43	3.97
50	-	1.66	1.92	2.21	2.55	2.93	3.36
55	-	-	1.66	1.91	2.18	2.49	2.84
60	-	-	-	1.63	1.85	2.10	2.39
65	-	-	-	1.38	1.56	1.76	1.99

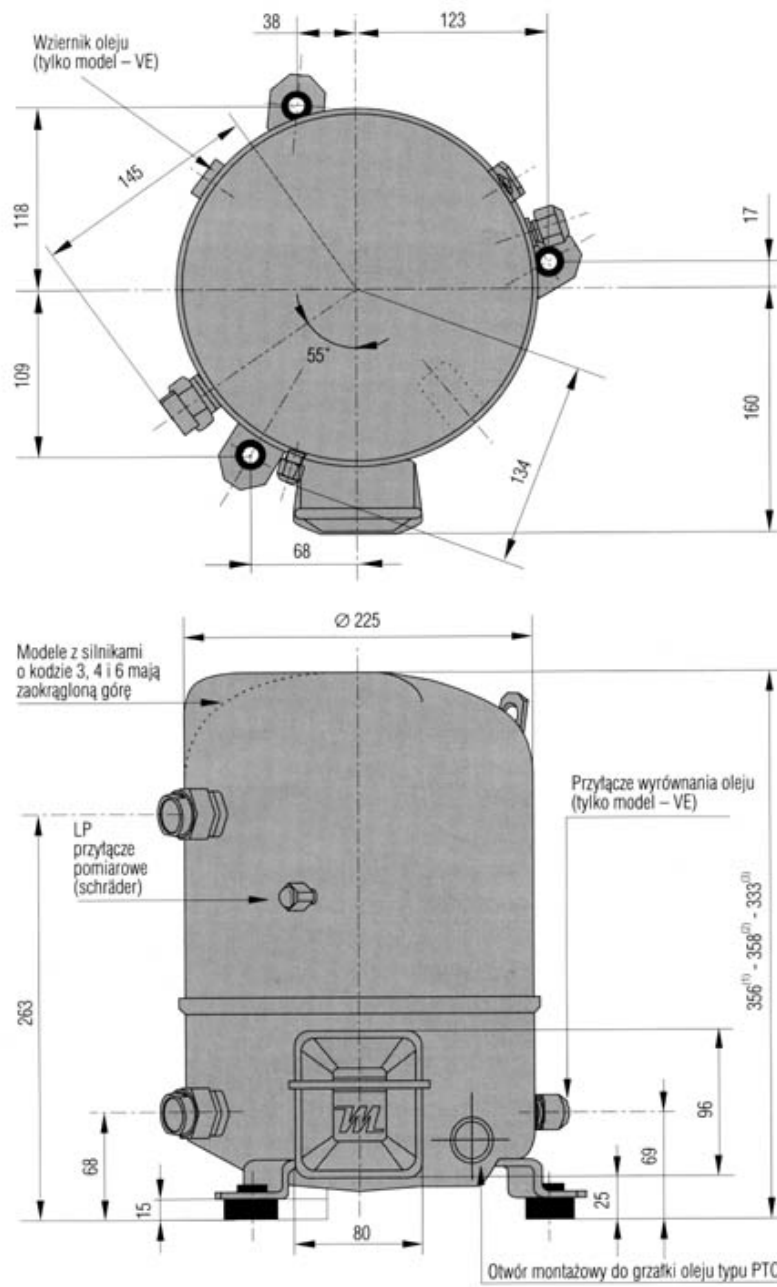
Operating conditions: suction superheat: 10 K, subcooling: 0 K

$t_c$  - Condensing temperature [°C]

$t_e$  - Evaporating temperature [°C]

**Application range**







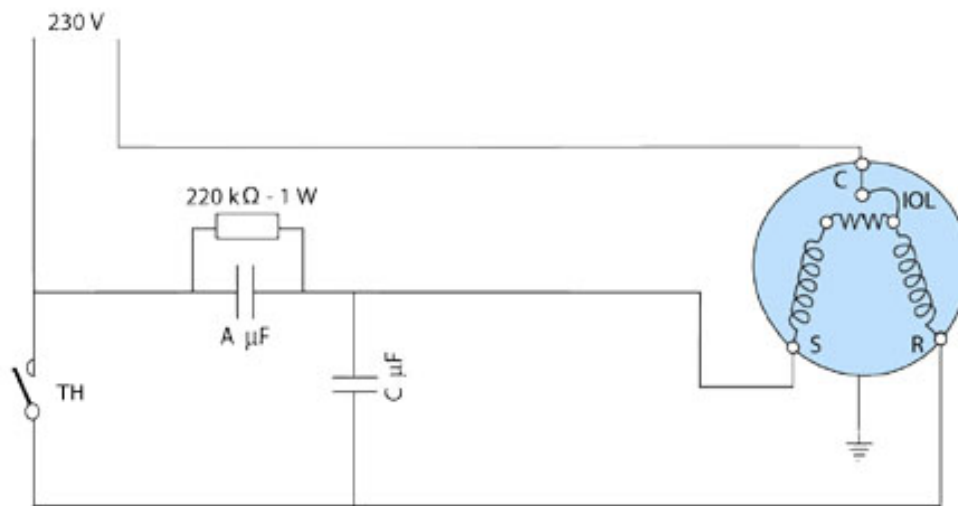


## Single phase power supply

### Electrical data

Motor voltage code:	1	5
Starting current [A]:	99	
Maximum Continuous Current (MCC) [A]:	34	
Winding resistance (between phases) (run/start) [ $\Omega$ ]:	0,53/2	/

### PSC starting with additional winding



IOL: inner motor protection (klixon)

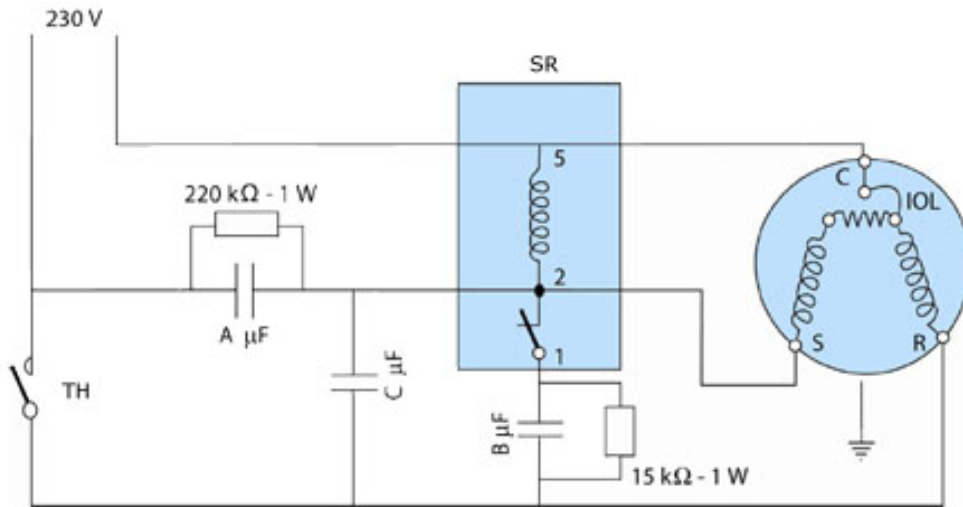
A, C: main condensers

C: starting condenser / S: common

TH: thermostat

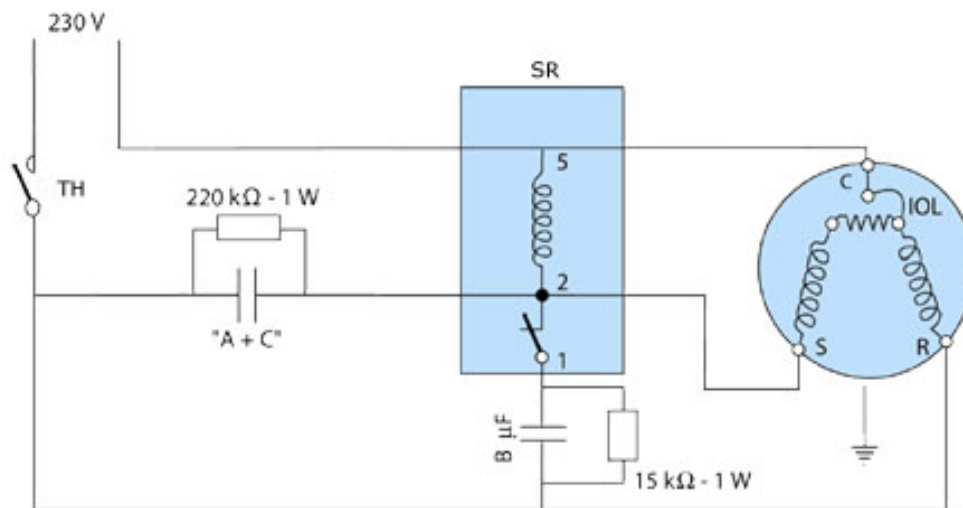
SR: movement transmitter

**CSR starting with additional winding**



- IOL: inner motor protection (klixon)
- A, C: main condensers
- B: starting condenser
- C: common / S: additional starting winding
- TH: thermostat
- SR: movement transmitter

**CSR starting without additional winding**



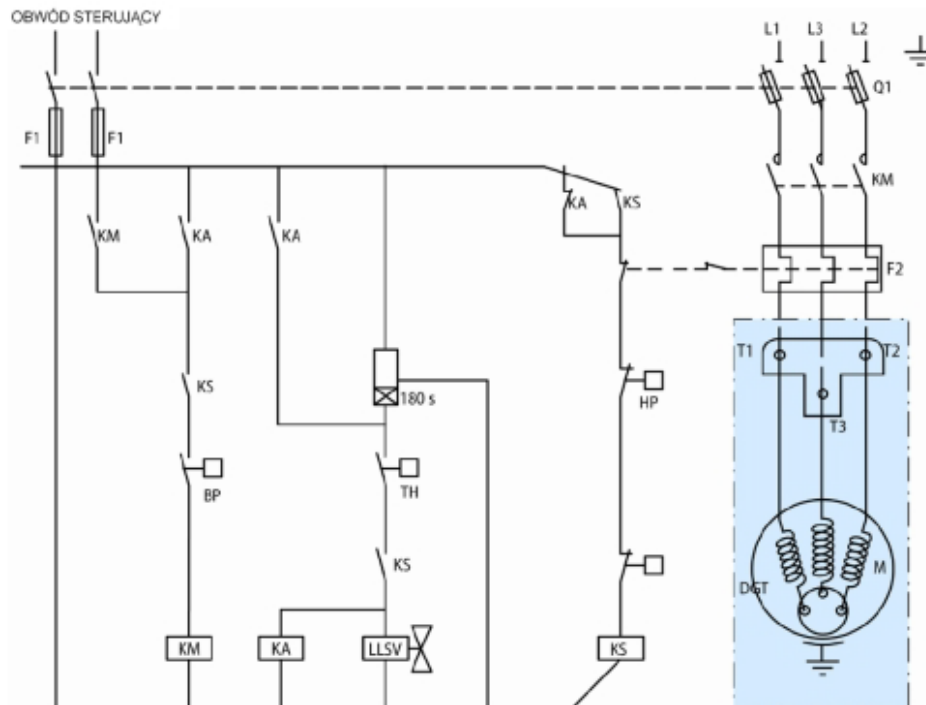
- IOL: inner motor protection (klixon)
- A, C: main condensers
- B: starting condenser
- C: common / S: additional starting winding
- TH: thermostat
- SR: movement transmitter
- condensers A and C are replaced by one condenser of capacity A + C

## Three-phase power supply

### Electrical data

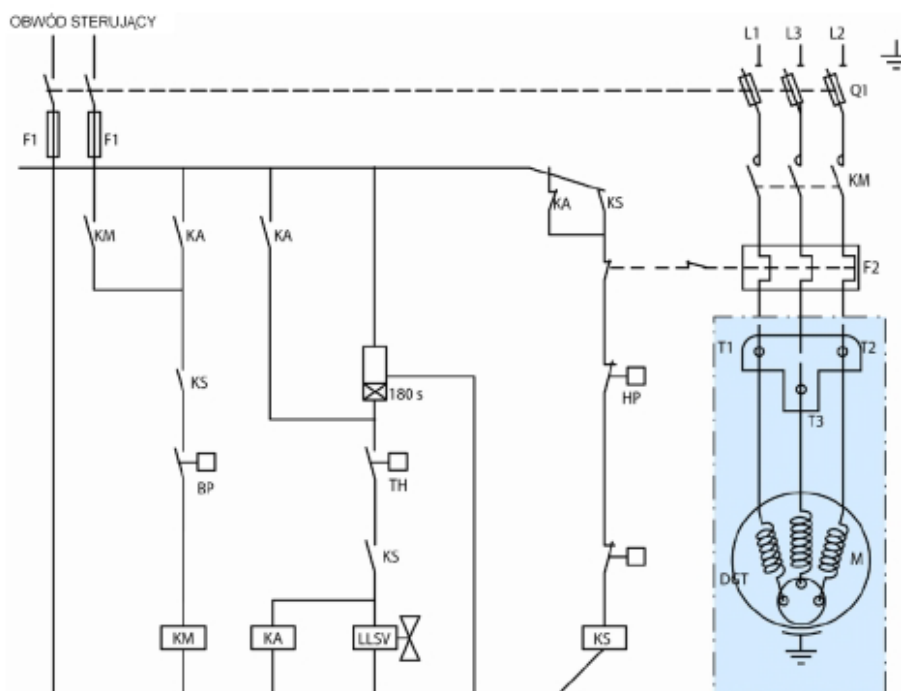
Motor voltage code:	3	4	6	7	9
Starting current [A]:	98	38	74		
Maximum Continuous	22	10	74		
Current (MCC) [A]:					
Winding resistance	0,95	4,56	0,95		
(between phases) [ $\Omega$ ]:					

### Connection diagram for systems without refrigerant suction



- TH: Termostat
- 180 s: Optional short cycle timer (3min) 5 pts
- KA: Control relay
- LLSV: Liquid Solenoid valve
- KM: Compressor contactor
- KS: Safety lock out relay
- BP: Low pressure switch
- HP: High pressure switch
- Q1: Fused disconnect
- F1: Fuses
- F2: External overload protection
- M: Compressor's engine
- thM: Motor safety thermostat
- DGT: Discharge gas thermostat

**Connection diagram for systems with refrigerant suction**



- TH: Thermostat
- 180 s: Optional short cycle timer (3min) 5 pts
- KA: Control relay
- LLSV: Liquid Solenoid valve
- KM: Compressor contactor
- KS: Safety lock out relay
- BP: Low pressure switch
- HP: High pressure switch
- Q1: Fused disconnect
- F1: Fuses
- F2: External overload protection
- M: Compressor's engine
- thM: Motor safety thermostat
- DGT: Discharge gas thermostat

## **Equipment**

- ▶ crankcase heater - PTC 35 W
- ▶ belt type heater - crankcase heater 55W, 230V
- ▶ Rotolock valves
  - suction: Rotolock valve connection 1 1/4", connection with supplied sleeve 5/8"
  - discharge: Rotolock valve connection 1", connection with supplied sleeve 1/2"
- ▶ soft-start kit - electronic softstart MCI 15C
- ▶ acoustic hood - acoustic shield of Danfoss catalogue number 7755001