IBS Cooling Systems

OPERATING MANUAL

SPLIT TYPE HERMETIC CONDENSING UNITS

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March 26 V1

IMPORTANT!

READ BEFORE PROCEEDING

GENERAL OPERATING INSTRUCTION

This operating manual contains information necessary for installation, operation and maintenance of ICF Condensing Units manufactured by IBS Isıtma Soğutma Havalandırma Taahhüt San. ve Tic. A.Ş. This manual should be considered as an integral part of the unit and should be read by the technician who shall install and operate the cooling unit. This manual should be kept near the unit for application when needed.

Before installation and operation of the unit, please be sure to read the manual attentively. It is important for your safety to understand the concepts in this manual. Please, ask for technical support from authorized operating/service personnel. Conform to the instructions in this manual for safe and efficient use of your unit.

No cooling refrigerant and oil should be used other than those stated on label of the unit. The system should not be operated before completion of installation and gas charging stated on label of the device.

The manufacturer doesn't bear any responsibility due to losses and damages arising out of use, operation and applications not stated in this manual.

1- In Case of Danger

- Cut off main power supply.
- Contact with the nearest service.
- Don't apply anything to the device except for emergency interventions until the authorized service directed by our service centre comes.

2- Operations upon the Unit

- Installation, operation and maintenance should be performed by authorized operating/service personnel.
- While making any operation upon the unit, the mains electrical feeding should be cut off and the unit should wait for 10-15 minutes for cooling.

2- Features of Place of the Unit

- No dust.
- The floor should be rigid, sound and safe taking weight of the unit into consideration.
- Should be protected against flood and being left under snow
- Should be mounted in a place which doesn't prevent air induction and release and which is open to atmosphere.
- If installed in a closed area, it should absolutely have sufficient ventilation and there shouldn't be overheating.
- Be sure all measures about human health and environmental safety are taken

SAFETY WARNINGS

- Pay attention to the warnings to prevent damages to you and your goods.
- Try to understand safety warnings and take necessary precautions.
- Even if you have sufficient experience and knowledge, if you are not authorized, and if you don't have sufficient experience and knowledge even if you are authorized, never attend to adjustments, controls, installations and repair works.
- Control panel has fatal electrical voltage. Turn off the main power supply switch and label it with a work in progress sign before maintaining or repairing the equipment
- The units subject to high internal pressure during operation. The pipes and equipment containing pressurized gas are made of materials resistant to internal and external forces. Damages to the pipes and equipment during transport, installation and maintenance shall decrease safety of the unit. Don't allow any equipment to be damaged by external effects.
- All tests, adjustments and controls of the units have been performed. Don't change connections and adjustments of equipment during installation, maintenance and service.
- Electrical board and circuits are only for authorized personnel. Safety and protection precautions in these fields are valid as long as you don't change adjustments and connections. Direct or indirect contact with these fields may lead to danger. Don't touch any electrical cables, boards, tools and connections for any reason whatsoever. Keep away these fields and be sure that you are insulated.
- The units contain switches, thermic, contactors and similar mechanisms prepared to create a certain safety and precaution mechanism to allow for performance of functions in the units. Don't interfere with these mechanisms. Replace if they are damaged.
- Mechanical components are enclosed within a closed structure and are insulated from external access. Do not open protective covers or guards while the refrigeration system is in operation. If any cover has been opened, ensure it is properly closed before starting the refrigeration system. Exercise caution when touching these areas, even if the refrigeration system is not operating.
- Keep away from hot fields and surfaces of the refrigeration system. Don't remain close to these fields and don't contact directly or indirectly. Even if the refrigeration system isn't operating, wait for their cooling before touching these fields.
- There are warning labels on the units against the situations (stated or not stated in this manual). Don't touch or keep away the places with warning labels. Conform to the instructions on the labels.
- If the labels become illegible, replace them. You can find meanings of labels and which instructions shall be applied in the section titled "Meanings of Safety Labels" of this manual.

MEANINGS OF SAFETY LABELS

This “ATTENTION” sign is an important safety warning.
Warning! Risk of serious injury or death to person!
Caution! Danger which can lead to serious damages!
Notice! Risk of damage to equipment!

High voltage. Fatal Electrical Voltage. It is used to protect users and maintenance personnel from contacting parts or areas that carry electrical risk when the refrigeration system is operating or during maintenance. This label indicates the presence of an electrical hazard. Do not touch these areas without proper insulation protection or without disconnecting the power source. Do not use water, oil, or similar substances for cleaning purposes. Ensure that these areas remain properly insulated at all times. Do not damage the protective cap, cover, or insulation components.

CONTENTS

NOMENCLATURE

PRODUCT NOMENCLATURE

1	2	3		4	5	6	7	8		9	10	11	12
I	C	F	-	3	C	L	1	2	-	C	X12	K	6

1. Manufacturer

IBS Cooling	I

2. Product Range

Condensing Unit	C
Central System	M

3. Cabin Type

Split	F
Industrial	E
Open Chassis	O
Midipack	S
Maxipack	V

4. Cabin/Condenser Code

Cabin/Condenser Code	X

5. Compressor Type

Scroll	C
Digital Scroll	D
Double Stage	K
Hermetic	H
Semi-Hermetic	S
Screw	V

6. Working Conditions

Medium Temperature	M
Low Temperature	L
Blast Freezing	F
Climate	B

7. Number of Compressors

Compressor Number	X

8. Number of Fans

Number of Fans	X

9. Compressor Brand

Bitzer	B
Copeland	C
Dorin	D
Maneurop	M
Danfoss	N
Embraco	E
Tecumseh	T

10. Cylinder Volume

Total Cylinder Volume	X

11. Refrigerant

R404A	Z
R407C	Z
R448A	K
R449A	L
R134a	Y
R410A	A
R452A	V
R717	N

12. Fan Speed

1400 rpm	4
660 rpm	6
890–990 rpm	8
Without Fan	0

PRODUCT FEATURES

Split Type hermetic condenser unit provides high efficiency and reliability for low to medium capacity cooling needs. It is ideal for display cases and cold rooms. Its compact design ensures quick and easy installation, minimizing maintenance requirements.

Standard features for all low to medium temperature model

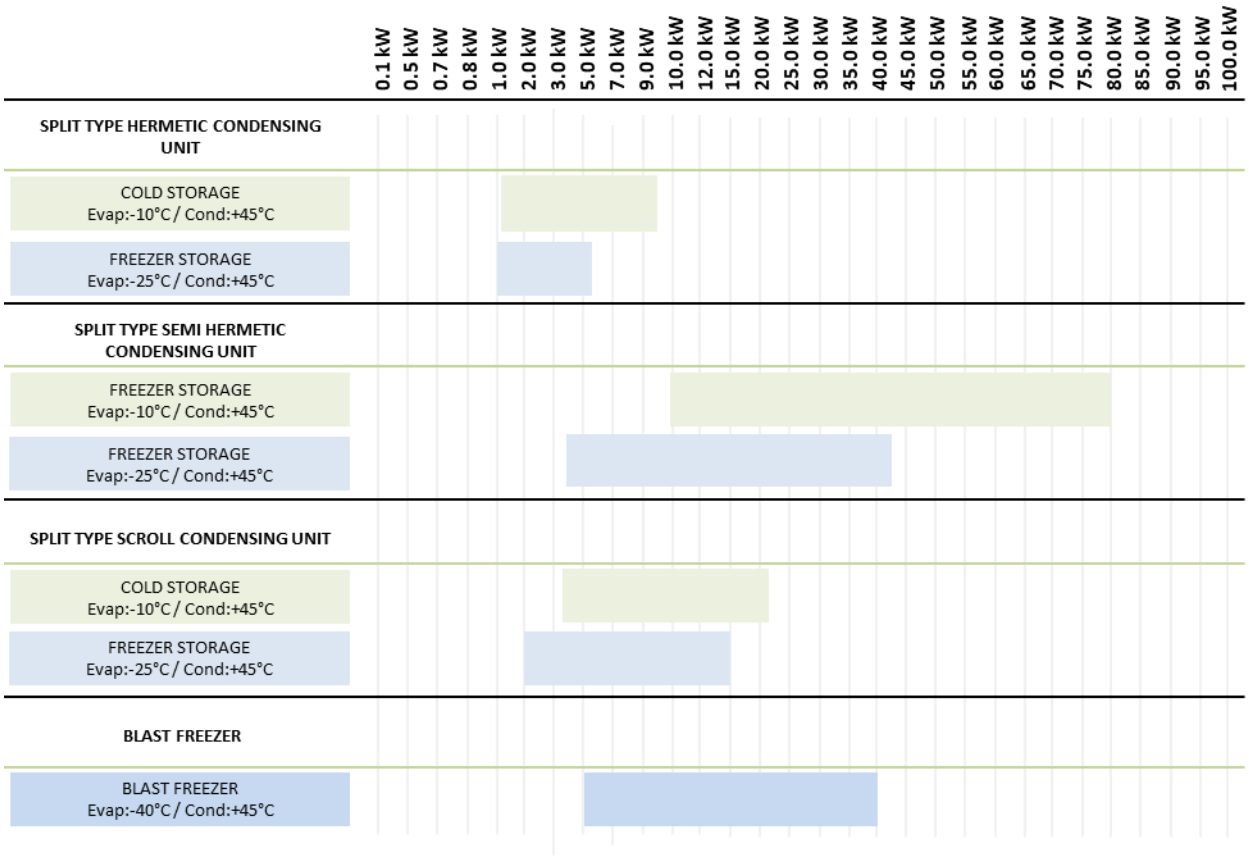
1. Compressor (Tecumseh, Embraco, Danfoss Maneurop)
2. Crankcase Heater
3. Air Cooled Condenser
4. Axial Fan
5. Liquid Receiver
6. Liquid Receiver Service Valve
7. Filter Drier
8. Solenoid Valve
9. Sight Glass
10. HP/LP Switch
11. Fan Pressure Switch
12. Integrated IP55 Electrical Panel

Optional Equipment's

1. Oil Separator (If added, the cabin dimensions can be change)
2. Suction Accumulator (If added, the cabin dimensions can be change)
3. Dual Pressure Switch
4. HP/LP Manometer
5. Fan Defrost Contactor
6. Acoustic Insulation for Compressor Compartment
7. Mechanical Fan Speed Controller
8. Safety Breaker
9. Signal Lamps

SPECIFICATIONS

Table 1: Capacity Diagram



Indıcator[1]:

- NC[a]: Nominal Current rated at condition (-10°C Te / +32°C Ta) for MT and (-35°C Te / +32°C Ta) for LT
- MCC[b:] Maximum Continuous Current
- LRC[c:] Locked Rotor Current
- SPL[d] @10m: Sound Pressure Level measured 10m from unit, in an anechoic room rated at (-10°C Te / +32°C Ta) for MT and (-25°C Te / +32°C Ta) for LT. Alternative conditions may produce different results
- The recommended oil type for Tecumseh compressors is polyester, and the oil viscosity should be 32 mm²/s.
- The recommended oil type for Danfoss compressors is Danfoss 175PZ.

[1]: The indicator belongs to Table 2.

Table 2: Technical Data

App.	Unit Model	C.O.P (Watt/W)				Compressor			Electrical Data								Liquid Receiver Volume	Airflow	Airflow	Connections		Unit Dry Weight	SPL @ 10m[d]	SPL @ 10m[d]
									Compressor			Fan												
												900		1400										
		R404A	R407C	R448A/ R449A	R452A	Type	Sw. Ept Volume	Oil Charge	Nc[a]	MCC[b]	LRC[c]	No	Total FLC	No	Total FLC		900	1400	Liquid	Gas		900 Rpm	1400 Rpm
							(m³/h)	(Litres)	(A)	(A)	(A)		(A)		(A)	(Litres)	(m³/h)	(m³/h)	(mm)	(mm)	(kg)	dB(A)	dB(A)
Medium Temperature	**ICF-0HM11-T4.6**	1,85	1,76	1,88	1,85	**CAJ 4517 Z**	4,6	0,48	5,10	12,7	38,5	1	0,35	1	0,7	2	1438	1981	10	16	52	33	49
	ICF-1HM11-T6.1	1,70	1,62	1,74	1,71	**CAJ 4519 Z**	6,1	0,48	7,25	15,2	45	1	0,55	1	0,7	3	1877	2268	10	22	59	34	49
	ICF-1HM11-T7.7	1,96	-	2,00	1,96	**FH 4524Z-XG**	7,7	1,14	3,96	6,6	26	1	0,55	1	0,73	3	2,608	2700	10	22	75	34	48
	ICF-1HM11-TX10	2,02	-	2,07	2,03	**FH 4532Z-XG**	10	1,14	4,868	7,33	30	1	0,8	1	0,73	4	3469	2436	10	22	72	43	48
	ICF-3HM11-TX13	2,03	-	2,09	2,05	**FH 4538Z-XG**	13	1,14	6,28	-	45	1	1,18	1	1,1	5	4322	4430	10	22	101	37	53
	ICF-3HM11-TX16	1,85	1,81	1,90	1,87	**TAG 4546 Z**	16	1,96	7,37	-	42,5	1	1,18	1	1,1	5	4322	4430	10	22	103	37	53
	ICF-3HM11-TX18	1,86	1,81	1,90	1,87	**TAG 4553 Z**	18	1,96	8,39	-	45	1	1,18	1	3	6	3892	5915	10	22	105	37	52
	ICF-3HM11-TX20	1,88	1,84	1,92	1,89	**TAG 4561 Z**	20	1,96	9,46	-	51,5	2	1,1	1	3	6	4513	5401	12	28	108	37	52
	ICF-4HM12-TX22	2,00	1,96	2,04	2,01	**TAG 4568 Z**	22	1,96	10,6	-	58	2	2,36	2	1,46	6	7386	6461	12	28	128	40	51
	ICF-4HM12-TX24	1,94	1,91	1,98	1,95	**TAG 4573 Z**	24	1,76	11,82	18,9	68	2	2,36	2	2,2	7	7386	8061	12	28	146	40	56
	ICF-1HM11-M6.0	1,9	1,87	1,93	1,97	**MTZ022**	6	0,95	3,9	6	20	1	0,55	1	0,7	2	1961	2268	10	22	68	34	49
	ICF-1HM11-M8.0	1,88	1,91	1,94	1,86	**MTZ028**	8	0,95	5,14	7,5	29	1	0,55	1	0,73	3	2608	2100	10	22	66	34	48
	ICF-1HM11-MX10	1,87	2,03	2	1,95	**MTZ032**	10	0,95	7,15	8	25	1	0,8	1	0,73	4	3469	2100	10	22	85	43	48
	ICF-3HM11-MX11	1,94	1,89	1,95	1,93	**MTZ036**	11	0,95	7,97	9	38	1	1,18	1	0,73	4	4322	3452	10	22	91	37	48
	ICF-3HM11-MX12	1,97	1,96	1,98	1,96	**MTZ040**	12	0,95	8,99	10	38	1	1,18	1	1,1	5	4322	4430	10	22	94	37	53
	ICF-3HM11-MX15	2,06	2,01	2,09	2,06	**MTZ050**	15	1,8	10,67	12	58	1	1,18	1	3	5	4090	5915	10	22	97	37	52
	ICF-3HM11-MX17	2,07	2,06	2,14	2,11	**MTZ056**	17	1,8	12,06	14	64	2	1,1	1	3	6	4682	5401	12	28	100	37	52
	ICF-4HM12-MX19	2,03	2,05	2,08	2,09	**MTZ064**	19	1,8	13,71	14	64	2	2,36	2	1,46	6	7882	6461	12	28	127	40	51
	ICF-4HM12-MX21	2,97	2,95	2,06	2,08	**MTZ072**	21	1,8	15,82	18	85	2	2,36	2	2,2	7	7882	8061	12	28	145	40	56
Low Temperature	**ICF-0HL11-T4.6**	1,72	-	1,799	1,741	**CAJ 2446 Z**	4,6	0,48	5,39	9,3	31,6	1	0,35	1	0,7	2	1461	1410	10	12	53	33	35
	ICF-0HL11-T6.1	1,62	-	1,699	1,641	**CAJ 2464 Z**	6,1	0,48	7,32	13	43	1	0,35	1	0,7	2	1438	1981	10	12	54	33	49
	ICF-1HL11-T9.4	2,07	-	2,155	2,108	**FH 2480Z-XG**	9,4	1,14	5,79	6,35	31	1	0,55	1	0,7	2	1877	2268	10	16	68	34	49
	ICF-1HL11-TX13	2,02	-	2,092	2,046	**FH 2511Z-XG**	13	1,14	8,37	8,3	60	1	0,55	1	0,73	3	2608	2436	10	16	71	34	48
	ICF-3HL11-TX20	1,84	-	1,881	1,801	**TAG 2516 Z**	20	1,96	10,85	-	42,5	1	1,18	1	1,1	4	4322	4430	10	22	108	37	53
	ICF-3HL11-TX24	###	-	1,909	1,842	**TAG 2522 Z**	24	1,96	12,88	-	63	2	1,1	1	3	4	4513	5401	10	22	115	37	52
	ICF-1HL11-M8.0	1,26	-	-	1,38	**NTZ048**	8	0,95	4,27	6	22	1	0,35	1	0,7	2	1485	2268	10	12	69	33	49
	ICF-1HL11-MX12	1,33	-	-	1,49	**NTZ068**	12	0,95	6,49	9	29	1	0,55	1	0,73	3	2608	2436	10	16	75	34	48
	ICF-3HL11-MX17	2,28	-	-	2,23	**NTZ096**	17	1,8	6,79	10	32	1	0,8	1	0,73	4	3469	3452	10	16	98	43	48
	ICF-3HL11-MX18	1,34	-	-	1,46	**NTZ108**	18	1,8	9,52	11	57	1	1,18	1	1,1	4	4322	4430	10	22	118	37	53
	ICF-3HL11-MX24	1,3	-	-	1,38	**NTZ136**	24	1,8	12,62	15	64	2	1,1	1	3	5	4682	5401	10	22	104	37	52

Table 3: Performance Data: Medium Temperature (R404A)

R404A					Cooling Capacity (Watts)						Power Input (Watts)					
	Unit Model	Compressor	HP	Tc / Te	-20	-15	-10	-5	0	5	-20	-15	-10	-5	0	5
Tecumseh Series	**ICF-0HM11-T4.6**	**CAJ 4517 Z**	1,3	45	1267	1650	2073	2559	3118	3759	908	1019	1122	1220	1316	1411
	ICF-1HM11-T6.1	**CAJ 4519 Z**	1,5	45	1619	2131	2704	3352	4088	4925	1314	1457	1595	1729	1861	1991
	ICF-1HM11-T7.7	**FH 4524Z-XG**	2	45	1590	2220	2948	3490	4765	5891	1064	1299	1505	1683	1831	1950
	ICF-1HM11-TX10	**FH 4532Z-XG**	2,5	45	2181	2913	3750	4715	5827	7106	1454	1660	1850	2024	2179	2316
	ICF-3HM11-TX13	**FH 4538Z-XG**	3	45	2808	3768	4848	6074	7471	9062	1875	2137	2386	2614	2815	2983
	ICF-3HM11-TX16	**TAG 4546 Z**	4	45	2823	4040	5470	7149	9111	11388	2105	2545	2949	3322	3668	3994
	ICF-3HM11-TX18	**TAG 4553 Z**	4,5	45	3257	4638	6234	8093	10257	12773	2377	2885	3554	3789	4195	4576
	ICF-3HM11-TX20	**TAG 4561 Z**	5	45	3880	5394	7122	9114	11421	14093	2770	3292	3782	4256	4728	5362
	ICF-4HM12-TX22	**TAG 4568 Z**	6	45	4827	6539	8494	10738	13317	16278	3101	3742	4325	4868	5392	5916
	ICF-4HM12-TX24	**TAG 4573 Z**	7	45	5355	7127	9174	11546	14293	17463	3512	4134	4766	5406	6053	6706
Maneurop Series	**ICF-1HM11-M6.0**	**MTZ022**	2	45	1574	2136	2812	3613	4550	5634	1190	1342	1482	1610	1724	1830
	ICF-1HM11-M8.0	**MTZ028**	2,3	45	2058	2803	3672	4676	5830	7147	1529	1750	1955	2141	2306	2446
	ICF-1HM11-MX10	**MTZ032**	2,7	45	2495	3312	4267	5375	6649	8105	1706	1941	2160	2363	2548	2714
	ICF-3HM11-MX11	**MTZ036**	3	45	3002	3931	5003	6236	7644	9244	2061	2327	2576	2806	3013	3,192
	ICF-3HM11-MX12	**MTZ040**	3,5	45	3524	4544	5714	7049	8568	10290	2368	2669	2948	3205	3439	3650
	ICF-3HM11-MX15	**MTZ050**	4	45	3913	5188	6703	8483	10550	12940	2620	2931	3218	3478	3708	3907
	ICF-3HM11-MX17	**MTZ056**	4	45	4138	5531	7189	9143	11420	14060	2810	3173	3513	3827	4112	4361
	ICF-4HM12-MX19	**MTZ064**	5	45	4996	6620	8552	10830	13500	16590	3318	3777	4204	4599	4956	5275
	ICF-4HM12-MX21	**MTZ072**	6	45	5661	7440	9555	12040	14920	18250	3752	4231	4686	5113	5509	5870

Table 4: Performance Data: Low Temperature (R404A)

R404A					Cooling Capacity (Watts)					Power Input (Watts)				
	Unit Model	Compressor	HP	Tc / Te	-35	-30	-25	-20	-15	-35	-30	-25	-20	-15
Tecumseh Series	**ICF-0HL11-T4.6**	**CAJ 2446 Z**	1	45	542	755	1005	1296	1633	598	710	823	938	1055
	ICF-0HL11-T6.1	**CAJ 2464 Z**	1,3	45	705	971	1285	1656	2088	810	956	1109	1269	1437
	ICF-1HL11-T9.4	**FH 2480Z-XG**	2,1	45	997	1483	2070	2770	3594	992	1237	1483	1728	1968
	ICF-1HL11-TX13	**FH 2511Z-XG**	2,9	45	1399	2083	2906	3888	5046	1435	1788	2145	2499	2846
	ICF-3HL11-TX20	**TAG 2516 Z**	3,7	45	1963	2721	3702	4906	6330	1955	2376	2825	3303	3808
	ICF-3HL11-TX24	**TAG 2522 Z**	4,5	45	2668	3562	4721	6143	7827	2530	2964	3444	3968	4536
Maneurop Series	**ICF-1HL11-M8.0**	**NTZ048**	1,5	45	847	1239	1931	2236	2856	835	1087	1328	1574	1794
	ICF-1HL11-MX12	**NTZ068**	2	45	1538	2111	3121	3572	4485	1543	1812	2017	2378	2678
	ICF-3HL11-MX17	**NTZ096**	2,5	45	1686	2431	3837	4512	5899	1673	2089	2517	2994	3475
	ICF-3HL11-MX18	**NTZ108**	3	45	2109	3008	4617	5342	6819	2033	2491	2907	3399	3846
	ICF-3HL11-MX24	**NTZ136**	4	45	2807	3892	5827	6748	8575	2862	3468	4017	4687	5285

Tc: Condensing Temperature(ºC)

Te: Evaporating Temperature (ºC)

Rating Condition: EN12900 RGT 20 ºC

All duties are +/- 10%

Table 5: Performance Data: Medium Temperature(R448A/R449A)

	R448A/R449A				Cooling Capacity (Watts)						Power Input (Watts)					
	Unit Model	Compressor	HP	Tc / Te	-20	-15	-10	-5	0	5	-20	-15	-10	-5	0	5
Tecumseh Series	**ICF-0HM11-T4.6**	**CAJ 4517 Z**	1,3	45	1163	1546	1990	2506	3107	3804	845	954	1059	1161	1261	1361
	ICF-1HM11-T6.1	**CAJ 4519 Z**	1,5	45	1483	2005	2601	3286	4076	4986	1217	1361	1502	1641	1778	1914
	ICF-1HM11-T7.7	**FH 4524Z-XG**	2	45	1459	2094	2842	3723	4760	5973	1007	1226	1424	1598	1746	1867
	ICF-1HM11-TX10	**FH 4532Z-XG**	2,5	45	2000	2745	3613	4630	5819	7203	1365	1564	1751	1926	2085	2226
	ICF-3HM11-TX13	**FH 4538Z-XG**	3	45	2624	3622	4767	6089	7616	9379	1781	2038	2286	2518	2726	2903
	ICF-3HM11-TX16	**TAG 4546 Z**	4	45	2603	3821	5286	7040	9122	11573	1977	2397	2790	3159	3508	3838
	ICF-3HM11-TX18	**TAG 4553 Z**	4,5	45	2995	4380	6017	7958	10256	12962	2233	2719	3176	3608	4017	4405
	ICF-3HM11-TX20	**TAG 4561 Z**	5	45	3555	5087	6869	8958	11414	14293	2600	3103	3585	4058	4535	5029
	ICF-4HM12-TX22	**TAG 4568 Z**	6	45	4424	6168	8202	10579	13353	16578	2979	3517	4021	4508	4995	5498
	ICF-4HM12-TX24	**TAG 4573 Z**	7	45	4892	6701	8832	11342	14291	17737	3325	3891	4473	5070	5677	6291
Maneurop Series	**ICF-1HM11-M6.0**	**MTZ022**	2	45	1562	2048	2647	3381	4272	5341	1112	1243	1369	1490	1602	1702
	ICF-1HM11-M8.0	**MTZ028**	2,3	45	1931	2530	3268	4175	5275	6599	1368	1530	1687	1837	1975	2098
	ICF-1HM11-MX10	**MTZ032**	2,7	45	2207	2908	3760	4792	6031	7506	1491	1684	1871	2050	2217	2369
	ICF-3HM11-MX11	**MTZ036**	3	45	2509	3351	4363	5567	6984	8638	1762	2005	2238	2458	2660	2842
	ICF-3HM11-MX12	**MTZ040**	3,5	45	2865	3840	5011	6400	8029	9922	2056	2340	2616	2878	3117	3329
	ICF-3HM11-MX15	**MTZ050**	4	45	3158	4380	5858	7630	9735	12210	2178	2538	2874	3177	3436	3642
	ICF-3HM11-MX17	**MTZ056**	4	45	3515	4871	6512	8481	10820	13580	2397	2793	3162	3495	3780	4007
	ICF-4HM12-MX19	**MTZ064**	5	45	4141	5680	7529	9722	12300	15290	2785	3218	3622	3988	4305	4563
	ICF-4HM12-MX21	**MTZ072**	6	45	4767	6539	8667	11190	14150	17600	3229	3730	4198	4621	4990	5292

Table 6: Performance Data: Low Temperature(R448A/R449A)

	R448A/R449A				Cooling Capacity (Watts)					Power Input (Watts)				
	Unit Model	Compressor	HP	Tc / Te	-35	-30	-25	-20	-15	-35	-30	-25	-20	-15
Tecumseh Series	**ICF-0HL11-T4.6**	**CAJ 2446 Z**	1	45	452	662	917	1221	1582	549	659	769	882	997
	ICF-0HL11-T6.1	**CAJ 2464 Z**	1,3	45	603	865	1188	1578	2045	770	914	1060	1211	1366
	ICF-1HL11-T9.4	**FH 2480Z-XG**	2,1	45	824	1305	1897	2616	3478	869	1110	1357	1605	1851
	ICF-1HL11-TX13	**FH 2511Z-XG**	2,9	45	1156	1832	2663	3673	4883	1257	1606	1962	2321	2676
	ICF-3HL11-TX20	**TAG 2516 Z**	3,7	45	1334	2140	3157	4413	5938	1684	2136	2602	3087	3596
	ICF-3HL11-TX24	**TAG 2522 Z**	4,5	45	1909	2896	4130	5654	7511	2155	2683	3235	3819	4442

Tc: Condensing Temperature(ºC)

Te: Evaporating Temperature (ºC)

Rating Condition: EN12900 RGT 20 ºC

All duties are +/- 10%

Table 7: Performance Data: Medium Temperature(R452A)

R448A/R449A					Cooling Capacity (Watts)						Power Input (Watts)					
	Unit Model	Compressor	HP	Tc / Te	-20	-15	-10	-5	0	5	-20	-15	-10	-5	0	5
Tecumseh Series	**ICF-0HM11-T4.6**	**CAJ 4517 Z**	1,3	45	1163	1546	1990	2506	3107	3804	845	954	1059	1161	1261	1361
	ICF-1HM11-T6.1	**CAJ 4519 Z**	1,5	45	1483	2005	2601	3286	4076	4986	1217	1361	1502	1641	1778	1914
	ICF-1HM11-T7.7	**FH 4524Z-XG**	2	45	1459	2094	2842	3723	4760	5973	1007	1226	1424	1598	1746	1867
	ICF-1HM11-TX10	**FH 4532Z-XG**	2,5	45	2000	2745	3613	4630	5819	7203	1365	1564	1751	1926	2085	2226
	ICF-3HM11-TX13	**FH 4538Z-XG**	3	45	2624	3622	4767	6089	7616	9379	1781	2038	2286	2518	2726	2903
	ICF-3HM11-TX16	**TAG 4546 Z**	4	45	2603	3821	5286	7040	9122	11573	1977	2397	2790	3159	3508	3838
	ICF-3HM11-TX18	**TAG 4553 Z**	4,5	45	2995	4380	6017	7958	10256	12962	2233	2719	3176	3608	4017	4405
	ICF-3HM11-TX20	**TAG 4561 Z**	5	45	3555	5087	6869	8958	11414	14293	2600	3103	3585	4058	4535	5029
	ICF-4HM12-TX22	**TAG 4568 Z**	6	45	4424	6168	8202	10579	13353	16578	2979	3517	4021	4508	4995	5498
	ICF-4HM12-TX24	**TAG 4573 Z**	7	45	4892	6701	8832	11342	14291	17737	3325	3891	4473	5070	5677	6291
Maneurop Series	**ICF-1HM11-M6.0**	**MTZ022**	2	45	1562	2048	2647	3381	4272	5341	1112	1243	1369	1490	1602	1702
	ICF-1HM11-M8.0	**MTZ028**	2,3	45	1931	2530	3268	4175	5275	6599	1368	1530	1687	1837	1975	2098
	ICF-1HM11-MX10	**MTZ032**	2,7	45	2207	2908	3760	4792	6031	7506	1491	1684	1871	2050	2217	2369
	ICF-3HM11-MX11	**MTZ036**	3	45	2509	3351	4363	5567	6984	8638	1762	2005	2238	2458	2660	2842
	ICF-3HM11-MX12	**MTZ040**	3,5	45	2865	3840	5011	6400	8029	9922	2056	2340	2616	2878	3117	3329
	ICF-3HM11-MX15	**MTZ050**	4	45	3158	4380	5858	7630	9735	12210	2178	2538	2874	3177	3436	3642
	ICF-3HM11-MX17	**MTZ056**	4	45	3515	4871	6512	8481	10820	13580	2397	2793	3162	3495	3780	4007
	ICF-4HM12-MX19	**MTZ064**	5	45	4141	5680	7529	9722	12300	15290	2785	3218	3622	3988	4305	4563
	ICF-4HM12-MX21	**MTZ072**	6	45	4767	6539	8667	11190	14150	17600	3229	3730	4198	4621	4990	5292

Table 8: Performance Data: Low Temperature(R452A)

R452A					Cooling Capacity (Watts)					Power Input (Watts)				
	Unit Model	Compressor	HP	Tc / Te	-35	-30	-25	-20	-15	-35	-30	-25	-20	-15
Tecumseh Series	**ICF-0HL11-T4.6**	**CAJ 2446 Z**	1	45	503	704	946	1235	1578	580	690	804	922	1043
	ICF-0HL11-T6.1	**CAJ 2464 Z**	1,3	45	664	926	1240	1616	2063	766	914,1	1070	1234	1407
	ICF-1HL11-T9.4	**FH 2480Z-XG**	2,1	45	902	1394	1992	2710	3563	925	1172	1424	1676	1924
	ICF-1HL11-TX13	**FH 2511Z-XG**	2,9	45	1266	1957	2796	3805	5002	1337	1695	2059	2423	2783
	ICF-3HL11-TX20	**TAG 2516 Z**	3,7	45	1472	2308	3331	4567	6043	1698	2154	2664	3208	3767
	ICF-3HL11-TX24	**TAG 2522 Z**	4,5	45	2147	3139	4355	5837	7629	2220	2759	3331	3942	4598
Maneurop Series	**ICF-1HL11-M8.0**	**NTZ048**	1,5	45	819	1216	1671	2199	2815	815	1059	1300	1534	1752
	ICF-1HL11-MX12	**NTZ068**	2	45	1467	2042	2730	3543	4494	1329	1535	1791	2116	2526
	ICF-3HL11-MX17	**NTZ096**	2,5	45	1688	2396	307	4441	5818	1604	2021	2467	2930	3397
	ICF-3HL11-MX18	**NTZ108**	3	45	2111	3087	4188	5465	6967	2092	2503	2943	3397	3855
	ICF-3HL11-MX24	**NTZ136**	4	45	2763	3924	5291	6900	8787	2718	3219	3778	4370	4975

Tc: Condensing Temperature(ºC)

Te: Evaporating Temperature (ºC)

Rating Condition: EN12900 RGT 20 ºC

All duties are +/- 10%

APPLICATION GUIDELINE

It should ensure that the refrigeration system which adopts this condensing unit, wherever possible to integrate pump down features. This is to avoid liquid compression which could damage the compressor.

Ensure that new compressors are not subjected to liquid abuse. Turn the crankcase heater on 12 hours before starting the compressor to avoid oil dilution and bearing malfunction.

Table 9: Operating Limits

Operating Limits	**Recommendation**
Maximum discharge gas temperature	Maximum 120^0C
Low Pressure Side	Minimum: 0,5 bar; Maximum 19 bar
High Pressure Side	Maximum: 28 bars
Evaporator Outlet Superheat	Above 6k (to avoid liquid flood back)
Suction gas superheat at compressor inlet	Not more than 20K
Voltage supply	1phase: Min: 207V, Max: 253V 3phase: Min: 360V, Max: 440V
Phase asymmetry	+/- 2%
Frequency	50Hz +/- 1%
Outdoor ambient	Min: -20^0C where head pressure control is recommended in low ambient conditions to avoid erratic TEV operation; Max: 43^0C
Maximum pipe run	25m

Suction line shall be insulated to avoid:

- High superheat during high ambient condition can create high discharge temperature.
- Too low superheat during low ambient condition that can condense refrigerant inside suction line.

HEALTH AND SAFETY

Only qualified personnel, who are familiar with refrigeration systems and components including all controls, should perform the installation and start-up of the system. To avoid potential injury, use care when working around coil surfaces or sharp edges of metal cabinets. All piping and electrical wiring should be installed in accordance with all applicable standards and local by-laws.

General Information

Before Installation

- Ensure the units received are the correct models for the intended application.
- Ensure the refrigerant, voltage and maximum working pressure are all suitable for the proposed application.
- Check there is no damage to the units. Any damage should be reported to the supplier immediately.
- Check that the proposed equipment locations are suitable and provide adequate support for the weight of the units.

Offloading and Lifting

- Whenever a condensing unit is lifted, it should be from the base and, where possible, all packing and protection is kept in position.
- If lifting equipment is required, ensure that it is suitable, certificated, and that the operators are qualified to use it.
- When using a fork-lift or pallet truck to lift the unit, the two support points should be sufficiently apart to give stability when lifting and suitably placed to distribute the load on the forks.
- If slings are used, care should be taken to ensure that the slings do not crush the casework or coil.
- When lifting by crane, use spreader bars to prevent compressing the top of the equipment.
- Do not drop the unit. Should this inadvertently happen, it should be immediately unpacked and inspected for damage.
- Use the appropriate spreader bars/lifting sling with the holes and lugs provided.

During Installation and subsequent maintenance

- Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and experienced with this type of equipment.
- Safe working methods are identified, and operators should/must have suitable Personal Protective Equipment (PPE).
- Ensure the working area has adequate ventilation during brazing procedures.
- The units contain moving machinery and electrical power hazards, which may cause severe injury or death. Disconnect and shut off power before installation or service of the equipment.
- Refrigerant release into the atmosphere is illegal. Proper evacuation, recovery, handling, and leak testing procedures must be observed all the time.
- Units must be grounded to the screw terminal labelled

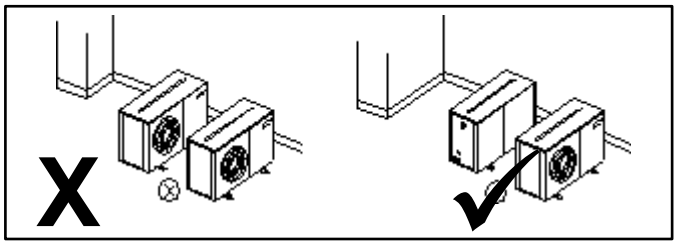
- No maintenance work should be attempted prior to disconnecting the electrical supply.

- The electrical covers and fan guards must remain fitted all the time.
- Use of the units outside of the design conditions and the application for which the units were intended may be unsafe and be detrimental to the units, regardless of short or long-term operation.
- The units are not designed to withstand loads or stress from other equipment or personnel. Such extraneous loads or stress may cause failure/leak/injury.
- The units are not designed to operate with any restrictions such as heavy snowfall around them. Additional measures (such as shielding of the units) shall be implemented as required.
- When the compressor operates under stabilized conditions, the oil level must be visible in the sight glass. Foam filling the oil sight glass indicates presence of large concentration of liquid to the compressor.
- No additional oil is required for installation with good oil returns, line runs up to 20m. Additional oil might be required if lines exceeded 20m, with minimum oil level must not lower than ¼ of sight glass (not applicable to compressor without sight glass). Top-up the oil while compressor is idle, via suction schrader connector with a suitable pump.

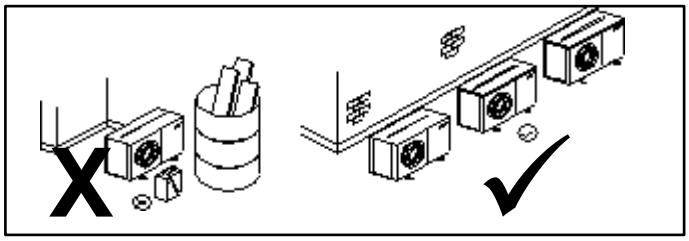
INSTALLATION

Unit Location

- In order to achieve maximum cooling capacity, the installation location for the condensing unit should be carefully selected.
- Install the condensing unit in such a way so that hot air ejected by the condensing unit cannot be drawn in again (short circuit of hot discharge air). Allow sufficient space for maintenance around the unit.



- Ensure that there is no obstruction to air flow into or out of the unit. Remove obstacles which block air intake or discharge.



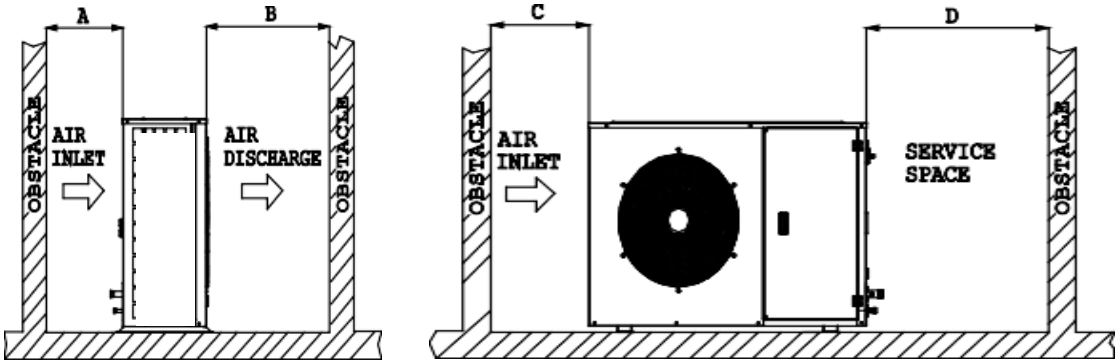
- The location must be well ventilated, so the unit can draw in and distribute plenty of air thus lowering the condensing temperature.
- To optimize the unit running conditions, the condenser coil must be cleaned at regular intervals.
- The unit must be level in all directions.
- It is recommended to install the unit on rubber grommets or vibration dampers

NOTICE

Special attention should be given if unit installed near to the sea as this can reduce unit lifespan due to corrosion of metal parts.

Installation Clearances

- The installation location should allow sufficient space for air flow and maintenance around the unit.



Indicator	A	B	C	D
Minimum Distance	300mm	1000mm	300mm	500mm

Field Piping

NOTICE

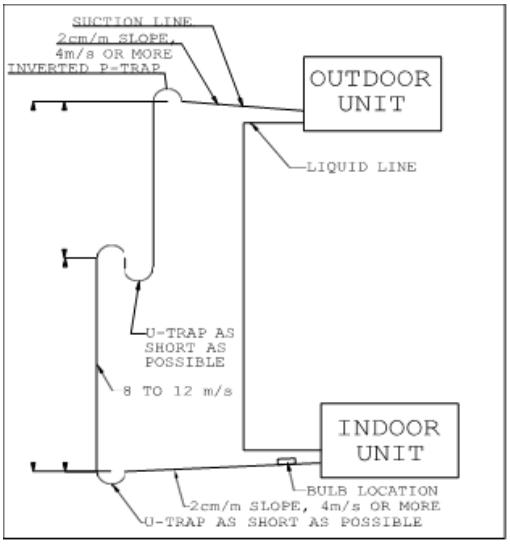
Pipe sizing should only be determined by qualified personnel. Correct line sizing will minimize the pressure drop and maintain sufficient gas velocity for proper oil return. All applicable standards must be observed in the installation of refrigerant piping.

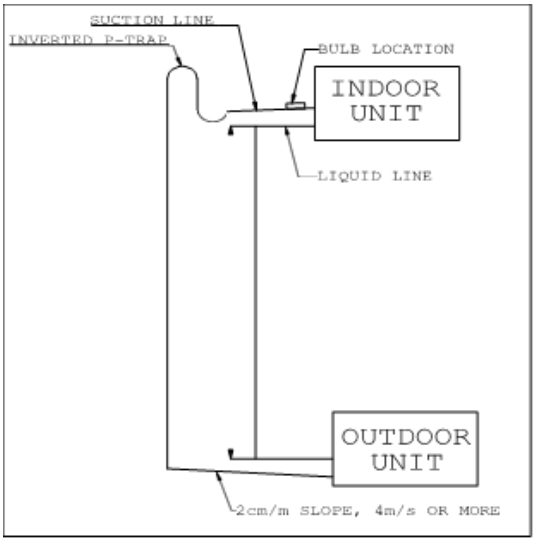
To ensure satisfactory operation and performance, the following points should be noted:

- Pipework routes must be as simple and as short as possible
- Avoid low points of pipework where oil can accumulate.
- Use only clean, dehydrated refrigeration grade copper tube with long radius bends.
- Avoid flare type connections and take great care when brazing.
- Dissimilar metals such as copper and brass shall be joined using an appropriate flux with high silver content filler material. Apply flux sparingly to the clean tube only and in a manner to avoid leaving any excess inside of completed joints.
- Run braze without over filling to ensure there is no leakage into the tube.
- To prevent oxidation, blow oxygen free nitrogen through pipework when brazing.
- To prevent condensation on pipe surface, install insulation on all suction lines and on all pipes penetrating walls or passing through hot areas.
- Adequately support all pipe work at a maximum of 2-meter intervals.
- For the condensing unit located above the evaporator, the use of U-trap and double suction risers is often required. These suction risers must always be fitted with a U-Trap at the bottom and a P-Trap at the top never be higher than 4m unless a second U-Trap system is fitted.
- Liquid lines should be sized to ensure a full supply of liquid refrigerant to the expansion device.
- For the condensing unit located below the evaporator, attention should be paid to the sizing of liquid lines on vertical riser by limiting the maximum rise to 6m.

- For the outdoor unit located below indoor unit: Inverted P-trap is necessary when pump down is not used. To prevent refrigerant from draining into the compressor during off-cycle
- Suction pipework should slope gently back towards the unit to assist oil return to the compressor. A fall of approximately 2cm per meter of pipework is acceptable.
- Additional oil may be required if piping length exceeds 20m or multiple oil traps are fitted. Check the oil level closely during commissioning and add oil, as necessary. Add oil in small amounts. **Do not overfill the compressor!**
- In some circumstances, a suction accumulator (its optional component) may be required. It offers protection against liquid refrigerant flow back during operation and against off-cycle migration by adding internal free volume to the suction side of the system.
- Tests must be conducted to ensure the amount of off-cycle migration to the compressor does not exceed the compressor's charge limit.
- Wherever possible the system should be installed to utilize a pump down configuration.
- The maximum recommended pipe length is 25m.
- It is recommended to install Pressure Relief Valve on the liquid receiver if there is a risk of fire incidence. Increasing temperature will lead to pressure increase in receiver.
- No valves and detachable joints shall be in areas accessible to the public except when they comply with EN 16084.

Figure 1 / Figure 2: Piping Layouts





Pressure Testing

NOTICE

Never use oxygen, dry air or acetylene for pressure testing systems as these may form an inflammable mixture.

- The condensing units are pressure tested in the factory prior to dispatch. All units come with a holding charge of oxygen free nitrogen. Remove the holding charge and indication tag prior to pipework installation using the service valve or regulator with pressure gauges and hoses.
- Once the pipework installation is complete, it should be pressure tested for leak prior to evacuation.
- A pressure leak test should be carried out using oxygen free nitrogen (OFN). A calibrated nitrogen pressure regulator must always be used. Before starting any pressure testing, ensure that the area

surrounding the system is safe, inform relevant personnel and fit warning signs indicating high pressure testing. Also, use the correct Personal Protection Equipment's.

- Always pressurize the system slowly, preferably in stages up to the maximum required pressure. Never exceed maximum test pressures shown in Table 6. Failure to obey the limit will cause premature failure on the pressure safety device.

Table 10: Test Pressure

High Side, bar
25

- Listen for any possible leaks and check all joints with bubble spray. If any leaks are discovered, release pressure slowly from both suction and liquid line of system until empty, repair leak and then repeat pressure testing procedure. Never attempt to repair a leak on a pressurized system.
- One testing has been completed satisfactorily, release the pressure from the system gradually and safety to external atmosphere.

Evacuation and Charging


NOTICE

Moisture prevents proper functioning of the compressor and the refrigeration system. Ensure that a good quality vacuum pump is used to pull a minimum vacuum of 250 microns measured at refrigeration system, and not at the vacuum pump gauge.

Once pressure testing has been completed, the system needs to be evacuated to remove any moisture from the piping. This can be done as follows:

- Ensure any nitrogen charge is safely released from the system.
- Connect a gauge manifold to the connections on the service valves on the condensing unit.
- Connect a vacuum pump and vacuum gauge to the system.
- Ensure all gauge manifold and service valves in open position.
- Evacuate the system until vacuum is below 250 microns.

Note: A triple evacuation procedure is recommended for all new systems or where moisture is suspected.

- Once the system is isolated and the vacuum pump is switched off, any rise is pressure indicates that either there may be a leak in the system or moisture is still present. In this case, recheck the system for leaks, repair as necessary, and then repeat the evacuation procedure.
- Once evacuation is completed satisfactorily, the vacuum pump and vacuum gauge can be removed. At this point, the refrigerant charge can be added to the system as required. Refrigerant blend must be charged in liquid form to avoid change of chemical properties.
- Ensure an adequate liquid charge (4-5bar) has been introduced to the high side of the system before starting the compressor.
- The remaining charge is slowly throttled into suction side until the installation has reached a level of stable nominal condition during operation. Charging liquid into the suction side of the system should ONLY be done with a metering device. Ensure a minimum operating pressure 0.5 bar is maintained when adding refrigerant to the suction side, otherwise overheating of the compressor may occur. Use calibrated weighing scales to record the amount of refrigerant added to the system.
- Stop the filling once obtain sufficient suction superheat and liquid subcooling, remove the cylinder from circuit.

NOTICE

Refrigerant charge by judging the liquid sight glass does not guarantee as 100% correct way.

Electrical

NOTICE

The main electrical supply to the condensing unit must be via a circuit breaker or fuse with appropriate motor capacity. Safety breakers are offered as an additional in our condenser units. When added, an additional isolator is not required unless site conditions or regulations dictate differently.

IBS Condensing units require power supply single or three phase which include Neutral and an Earth. These systems are not suitable for any other supply voltages (other than specified in **Table 9**).

- Mains supply cable type and size must be selected to suit the application and the electrical installation should conform to the current local standards.
- Cables to the condensing unit should, wherever possible, be routed through the cable glands supplied on the side of the units.
- Ensure that the power supply corresponds to the unit and that the power supply is stable.
- Connect power supply according to the present norm and legal requirement. Ensure that the unit is properly connected to the ground.
- The unit is equipped with a motor circuit breaker with thermal overload and magnetic trip short circuit protection for the unit. It was preset from factory and never set value higher than set current on wiring diagram.

Reserve Rotation Protection and Voltage Unbalance

IBS condenser units equipped with a 3-phase compressor include a phase protector as standard equipment. Thus, it is necessary to ensure correct incoming line voltage variance within +/- 2% during commissioning.

- Don’t use a megohmmeter nor apply power to the compressor while the system under vacuum as this may cause internal damage to the compressor.
- Never start the compressor under vacuum (don’t operate the compressor with the low-pressure cut-out bypassing), as this will cause the rotating part to overheat very quickly causing premature failure.
- There must be no more than 10 compressor’s start per hour. A higher number reduces the service life of the compressor. There is no minimum off time for the compressors. Adequate minimum run time is required to ensure proper oil return.

COMMISSIONING

To gain access to the electrical box, turn the main switch on the electrical mains feeder or motor rated circuit breaker on the side/front of the unit to the OFF position and loose the screws on the left-hand side of the door. The electrical box is located behind the door. Remove the screws in the electrical box cover to access components.

Pre startup checks

Before starting the condensing unit, the following checks should be carried out as a minimum:

- Check electrical supply is correct and all connections are sound.
- All moving parts are free, and guards are fitted.
- Compressor oil level satisfactory.
- (If Any) Initial settings for safety switches and fan speed control
- Overload set correctly on motor rated circuit breaker.
- All valves are in correct operating position.
- Initial refrigerant charge.
- Crankcase heater energized for a minimum of 6 hours before compressor start-up.
- Gauge manifold connected to both low and high sides of system.

Running the Unit

- Turn the main switch on the electrical main feeder or motor rated circuit breaker on the side/front of the unit to the “ON” position. (It is optional equipment)
- Run the unit and check compressor and condenser fan operation.
- Check system pressures and temperatures, gas charge and running currents of motors to ensure correct operation.
- Check compressor suction superheat. This should be between 8K and 15K for normal operating conditions.
- (If Any) Final adjustment of safety switch settings and fan speed control.
- Allow the system to run for 3-4 hours. Check compressor oil level and top up with the correct oil type as required. Recheck the compressor oil level again after 24 hours operation.
- Carry out final leak test and ensure all panels/covers are fitted and screws tightened.
- Log all information along with the system model and serial numbers for future reference.
- Ensure that the customer/responsible person is provided with basic operating instructions and where electrical isolators are situated in case of emergency.

Pressure Switch Settings

Both the LP and HP switch settings must be adjusted to suit application before starting the unit. Ensure that the high-pressure setting doesn’t exceed the value shown in **Table 11**.

High Pressure Safety

- The high-pressure safety switch is necessary to stop the compressor when the discharge pressure exceeds the compressor’s high-side operating pressure.
- The high-pressure switch can be set to lower values depending on the application and ambient conditions.

Low pressure protection

- The low-pressure protection cut out switch protects the compressor against deep vacuum operation, a potential cause of failure due to internal arcing and operating outside the compressor limits.
- The low-pressure protection cut out should never be set lower than the min. LP cut out value in **Table 11.** For systems without pump-down integrated, the LP switch signal contact shall be used to energize a low-pressure safety alarm.

- If a thermostat is used for room temperature control, and a pump down feature is not integrated, a low-pressure control of the manual reset type should be wired in series with the thermostat to serve as a protection cut-off in the event of loss of refrigerant charge of other abnormal conditions which resulting in low suction pressures.
- When used for low temperature operational control, a low differential pressure should be applied to the low-pressure control for accurate control. For Accuracy, cooling pressure gauges should be used to set the cut-in and cut-out points, as the indicator on the front of the pressure switch isn't accurate enough for control purposes.
- Compressor operating pressures must be maintained within the limits specified in **Table 11**.

Table 11: Compressor Operating Pressures in bar

Series	Tecumseh	Maneurop	Tecumseh	Maneurop
Application	Medium T.		Low T.	
Compressor Family	CAJ/FH/AJ/TAG	MTZ	CAJ/FH/TAG	NTZ
Refrigerant	R404A R407A R407F R448A R449A R452A	R404A R407A R407F R448A R449A R452A	R404A R448A R449A R452A	R404A R448A R449A R452A
Min LP Cut Out	1,5		0,1	
Max HP Cut Out	27,7		27,7	
LP Range	1,5-8,3		0,1-3,3	
HP Range	13,2-27,7		13,2-27,7	

Dual Pressure Switch (Optional Equipment)

The dual pressure switch fitted to condensing units is auto reset for low pressure side and high pressure are NOT factory preset for application.

Figure 3: Adjustment on Danfoss KP15

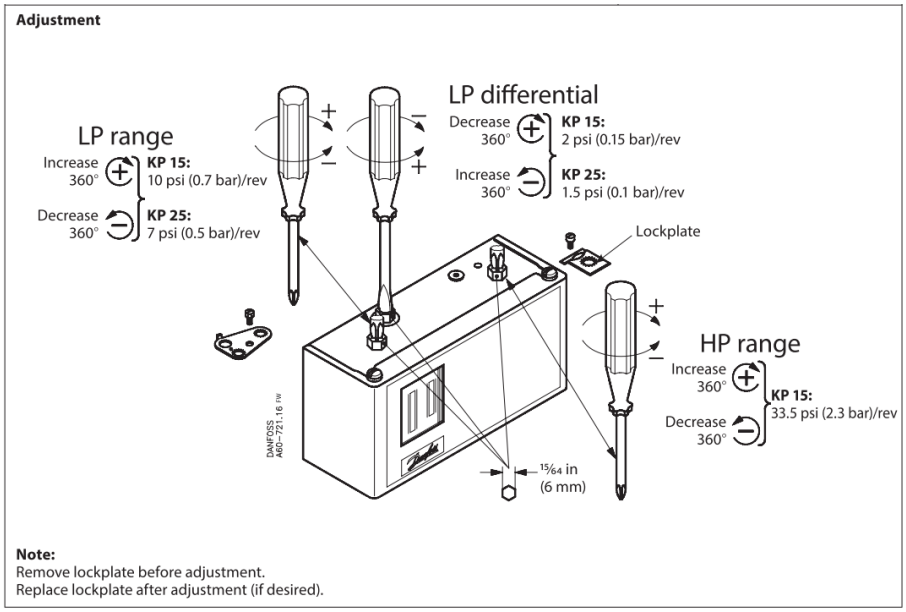


Table 12: Dual Pressure Switch Manufacturer Setting

Model	High (bar)		Low (bar)	
	Cut Out	Diff (Fixed)	Cut In	Diff (adj)
KP15	18	4	3	2

Fan Control Switch ACB-2UA 305W

The fan control switch is factory set as Table 13. Fan stopped when the pressure drop below fan cut out pressure.

Table 13: Fan Control Switch Factory Setting

Model	Fan control Switch (bar)	
	Cut in	Cut Out
ACB-2UA 305W	16	13

Fan Speed Controller XGE-4C (Optional Equipment)

The fan speed controller is factory set to 19barg (maximum speed) and cut off when drop below 13barg, for operation with R4*** series refrigerant to ensure compressor always operates within the unit operating envelope.

1 Turn	~1.5bar
Full voltage adjusting range	10~25barg
Full voltage set point (factory setting)	19barg full speed, mode: cut off at Pmin.
Effective proportional band	6 barg (fixed)

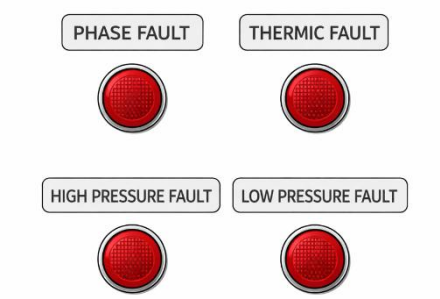
Crankcase Heaters

- Crankcase heater should remain energized during the compressor off cycles. The initial start in the field is a very critical period for any new compressor because all load-bearing surfaces are new and require a short break-in period to carry high loads under adverse conditions. Thus, the crankcase heater must be turned on a minimum of 6 hours before the first-time start, to prevent oil dilution and bearing stress on initial start-up.
- To energize the crankcase heater while keeping compressor OFF, isolate the compressor from circuit by removing jumper wire which in series with H/L pressure switch.

Signal Lamps (Optional Equipment)

- Optional signal lamps may be installed on the IBS for fault indication. The descriptions of these signal lamps are given below. These signals are for Hermetic Split Series.

-Phase Fault - The red LED lights up when there is a phase imbalance.
-High Pressure Fault - The red LED will light up when the high pressure exceeds the set value.
-Low Pressure Fault - The red LED lights up when the low-pressure drops below the set value.
-Thermic Fault - The red LED illuminates when the compressor displays a thermic fault.



Safety Braker (Optional Equipment)

- It is an easily accessible, red-colored safety device that instantly cuts off the electricity to machinery or equipment in case of danger, thus protecting people and equipment.

Units with Microchannel Condenser

- Caution must be taken when charging a unit containing a microchannel condenser coil.
- The microchannel coils hold less refrigerant than traditional fin/tube coils, it is easier to be overcharged, especially if the system is commissioned during wintertime which ambient temperature is colder.
- Adding too much refrigerant can cause the high-pressure switch to malfunction in hot weather.
- Always check that the amount of condenser sub cooling isn't excessive which may indicate refrigerant overcharge.

System Operation

- Once the system is correctly charged with refrigerant and the operating condition is stable, check that the compressor suction superheat is between 8K-15K and that the compressor discharge temperature is between 50°C-90°C.
- A compressor suction superheat that is too low may indicate liquid refrigerant return to the compressor, whereas a suction superheat that is too high will not provide enough cooling effect for the compressor and will cause high discharge temperatures. In either case, it is likely that compressor damage/failure will occur.

Precautions when operate with FH and AJ Tecumseh Compressor's

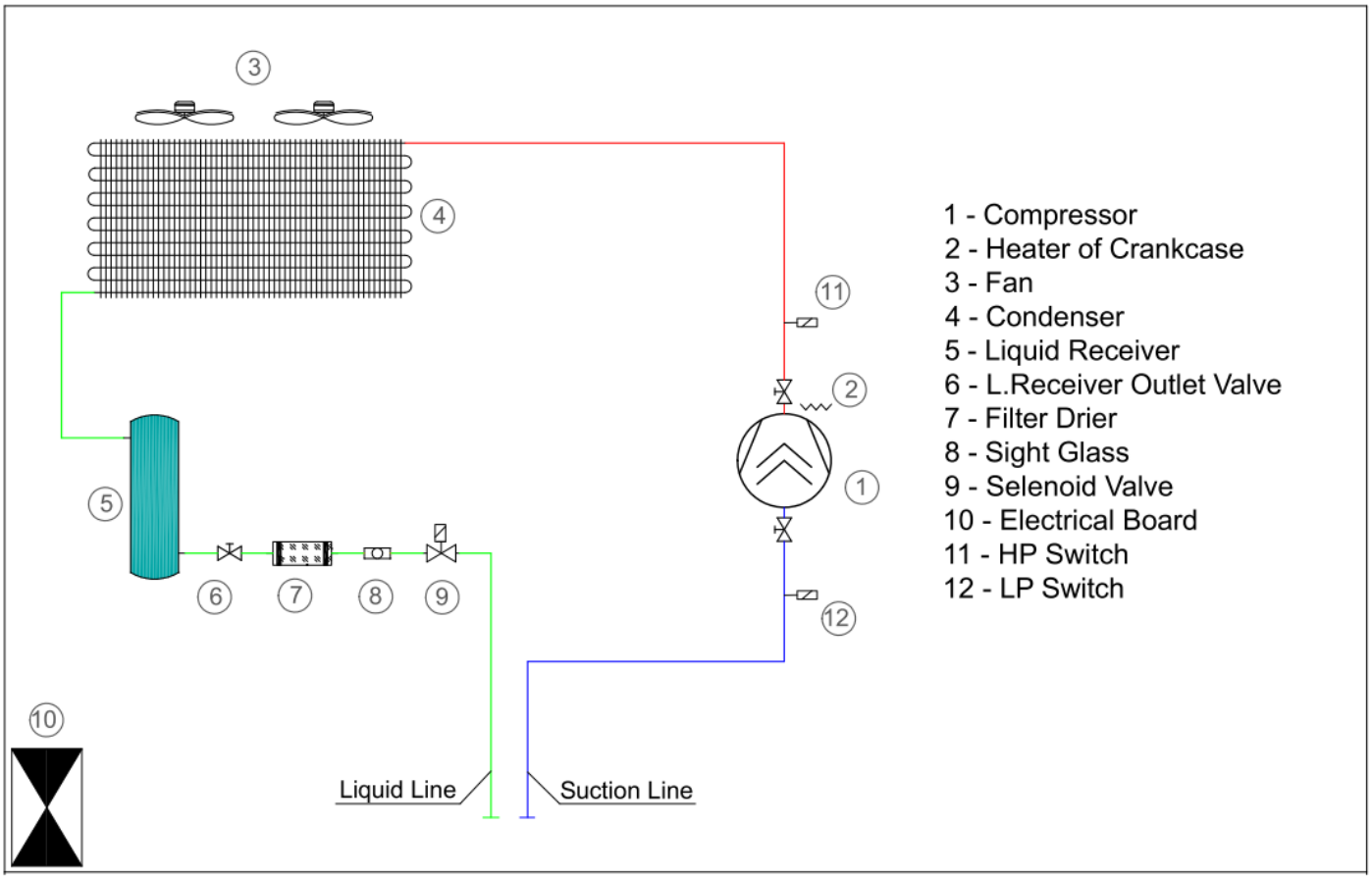
Follow instructions below when operating R448A/R449A in low temperature condensing unit which integrated with Tecumseh Compressor FH/AJ

NOTICE

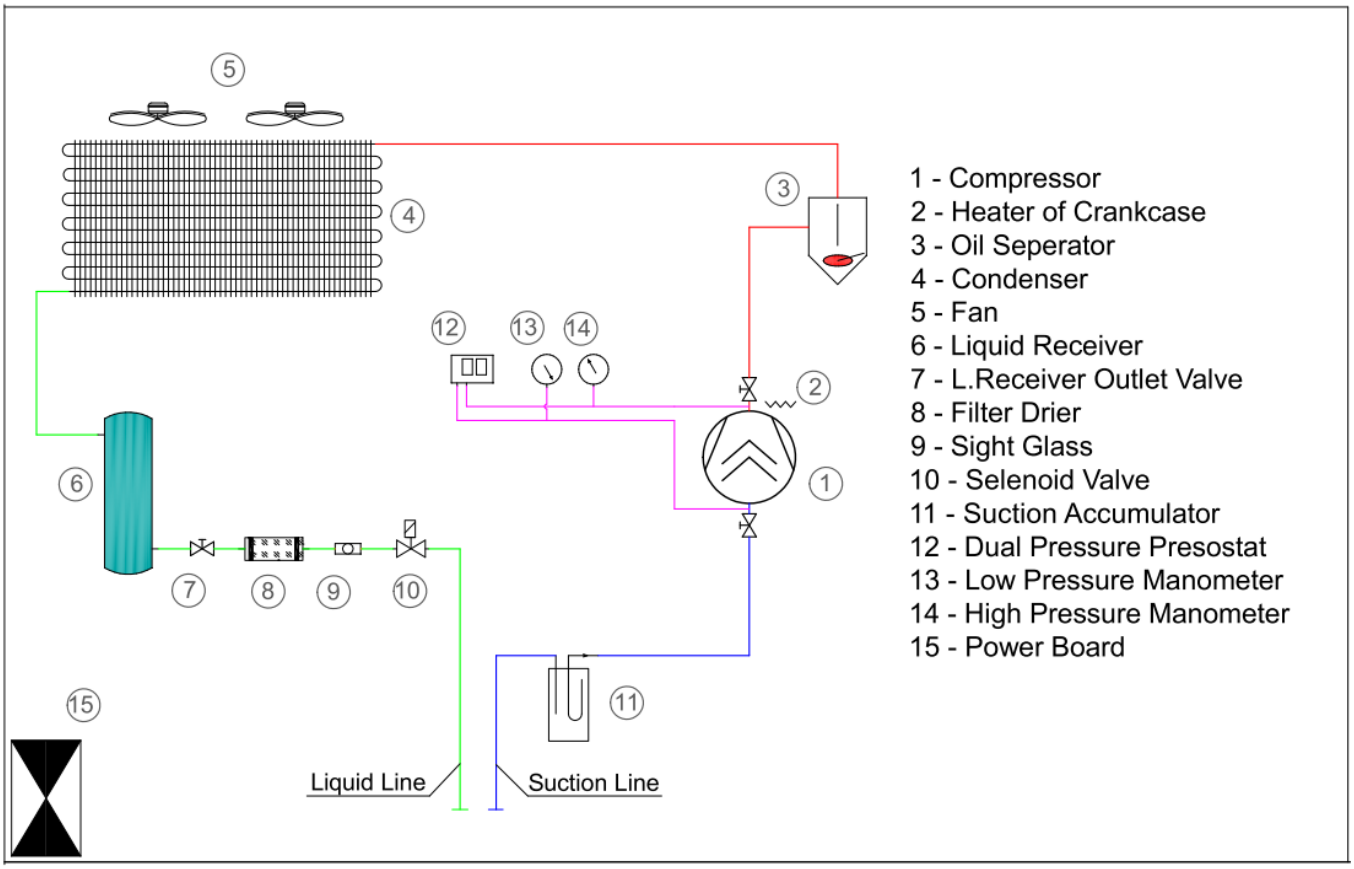
Limit the suction superheat below 10K, to ensure discharge temperature is maintained below 120^{0}C with evaporating temperature of -30^{0}C and below. Don't use capillary tubes as throttling devices to prevent plugging issue.

CYCLE DIAGRAM AND EQUIPMENT

Mechanical Diagram with Standard Equipment's



Mechanical Diagram with Optional Equipment's



SERVICE & MAINTENANCE


NOTICE

Disconnect the main power supply before servicing and opening the unit.

IBS Condensing units are designed to give long life operation with minimum maintenance. However, they should be routinely checked, and the following service schedule is recommended under normal circumstances:

Removing the top, side and front panels will provide access to all components.

1. Compressor

Inspect at regular intervals.

- Check electrical connections.
- Check operation of crankcase heater.
- Check mountings for tightness and wear.
- Check for refrigerant leaks on all joints and fittings
- Ensure that no abnormal noise or vibration is detected during test run
- Check the compressor oil levels and top up if required. The oil level should be ½ to ¾ way up the sight glass. (if sight glass is fitted)

2. Traditional Finned & Tube Coil Condenser and Fan Motor & Blade

Clean and inspect at regular interval.

- For optimal efficiency, clean the finned & tube condenser and the unit at least once a year.
- Ensure that the fan motor is clean and spins freely.
- Check that the condenser fan blade is clean and free from restriction and damage/imbalance.
- Check for abnormal noise, vibration, and fan imbalance
- Note: The fan motor is pre-lubricated, and factory sealed so no maintenance is necessary.

3. Microchannel Condenser Coil

Clean and inspect at regular intervals.

- Remove surface dirt, leaves etc. with a vacuum cleaner (preferably with a brush or other soft attachment rather than a metal tube), compressed air blown from the inside out, and/or a soft bristle (not wire!) brush. Don't impact or scrape the coil with the vacuum tube, air nozzle, etc.
- Microchannel heat exchangers tend to retain more water than traditional finned and tube coils due to their fin geometry. Depending on the specific design and installation of your coil, it may be beneficial to blow or vacuum away the rinse water from the unit to speed up the drying process and prevent water accumulation.
- **DON'T** use any chemicals to wash microchannel heat exchangers (includes those marketed as coil cleaners). They can cause corrosion. Simple rinse. Clean the Microchannel gently, preferably from the inside out and from top to bottom, by running water through each fin passage. Microchannel fins are stronger than conventional tubular and finned coil fins, but should still be handled carefully. Don't strike the coil hard with the hose. We recommend covering the end of the hose with your thumb

instead of a nozzle tip, as this makes the spraying gentler and reduces the likelihood of impact damage.

4. Controls

- Check settings and operation of pressure switches.
- Check overload setting.
- (If any) Check fan speed control settings and operation.

5. Power Supply

Inspect at regular intervals.

- Check the running current and voltage for the condensing unit.
- Check the electrical wiring and tighten the wires onto the terminal blocks if necessary.

6. Refrigerant Charge

- Check the refrigerant charge, ensuring the system is functioning correctly, pressures are as expected, and the fluid level indicator shows a full refrigerant level.
- Perform a complete leak test.

7. Compressor Replacement

- The rotalock connections used on some compressor models are factory sealed with sealant. If the rotalock connections need to be disassembled (e.g., compressor change), then they should be thoroughly cleaned and sealant reapplied before reassembly. In case of difficulty undoing the connections due to the sealant, apply heat to the rotalock using a heat gun for several minutes and then loosen using hand tools while hot.

8. Unit decommissioning and disposal

- At the end of the unit's useful life, the appliance must be decommissioned by suitably operating/service personnel. Refrigerant and compressor oil are classified as hazardous waste and therefore must be properly recovered and disposed of, including completing waste transfer documentation. The appliance components must be properly disposed of or recycled.

9. Warranty

- The warranty on products manufactured by IBS is contingent upon correct application, placement, and installation procedures, as well as registered maintenance/service performed in accordance with our recommendations. Failure to do so may violate our warranty.

F-GAS REQUIREMENT

The models of equipment discussed in this Operational Manual rely on fluorinated greenhouse gases to perform their functioning.

All condensing unit models come from the factory pressurized with Oxygen Free Nitrogen (OFN) only.

In the EU 517/2014 F-Gas Regulation, the requirement for leak testing in a system is based on the CO2 equivalent charge amount in tons. This means that systems using refrigerants with a higher GWP must be leak tested more frequently than systems using refrigerants with a lower GWP at the same charge weight.

The three new threshold values for leak testing requirements based on Global Warming Potential (GWP) and T CO_2Eq (Tons of CO_2 Equivalent) of refrigerants specified for use are as follows:

		Refrigerant Charge- kg		
Refrigerant	**GWP**	**5T CO_2Eq**	**50T CO_2Eq**	**500T CO_2Eq**
R32	675	7,41	74,1	741
R134A	1430	3,49	34,9	349
R404A	3922	1,28	12,8	128
R407A	2107	2,4	24	240
R407C	1774	2,82	28,2	282
R407F	1387	3,6	36	360
R410A	2088	2,39	23,9	239
R422D	2729	1,83	18,3	183
R448A	1387	3,6	36	360
R449A	1397	3,6	35,8	358
R1234ze	7	714,3	7143	71430

Previous Limits For Testing	**3kg**	**30kg**	**300kg**

From January 1, 2017, the requirement for leak detection and system logging has changed from 3 kg of HFC to 5 T CO_2Eq.

$$TCO_2\ Eq = \frac{Refrigerant\ Charge\ (kgs) \times Refrigerant\ GWP}{1000}$$

A refrigerant charge label is supplied with each unit (inside the electrical box). The total refrigerant charge for the system and the TCO2 Eq to be calculated using the above formula and the values must be entered on the label with indelible ink. The label must be adhered to the proximity of the product charging port. The label supplied will represent the refrigerants approved for use with that unit.

WIRING DIAGRAMS

With Standard Equipment's

Figure 4: Monophase Split Hermetic Condensing Units with 1 Fan

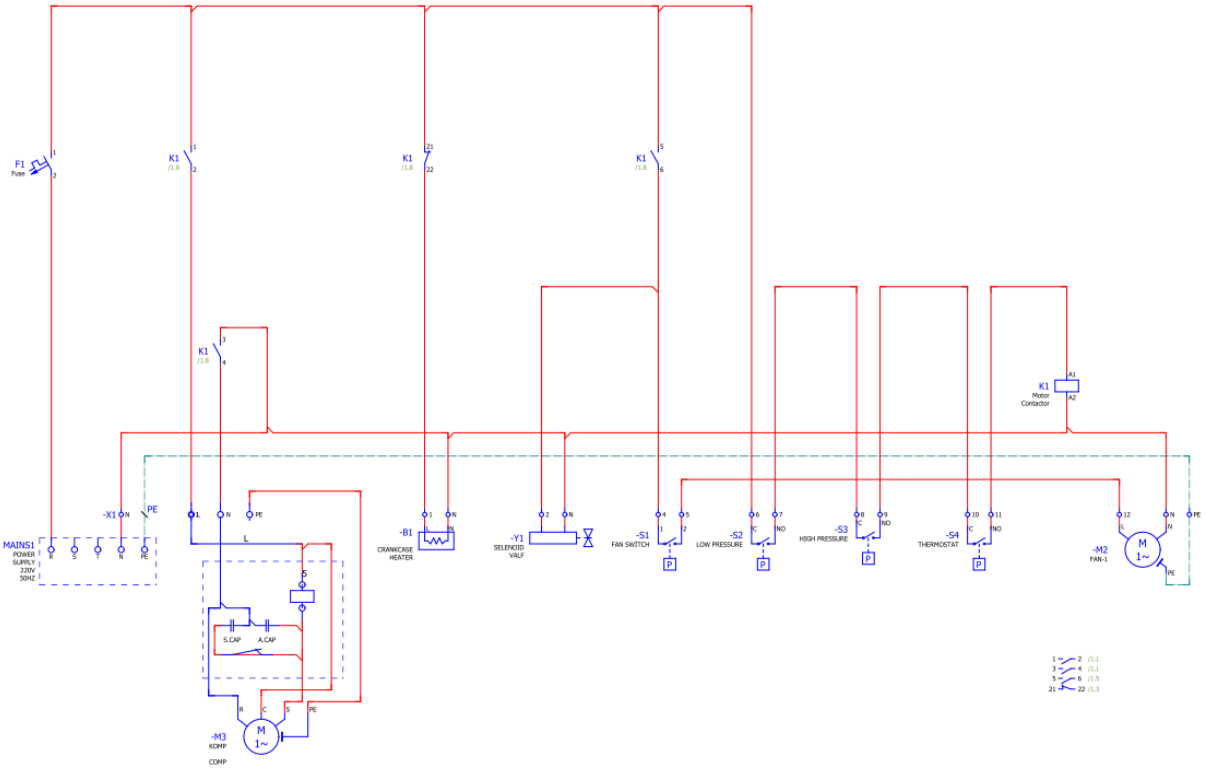


Figure 5: Three phase Split Hermetic Condensing Units with 1 Fan

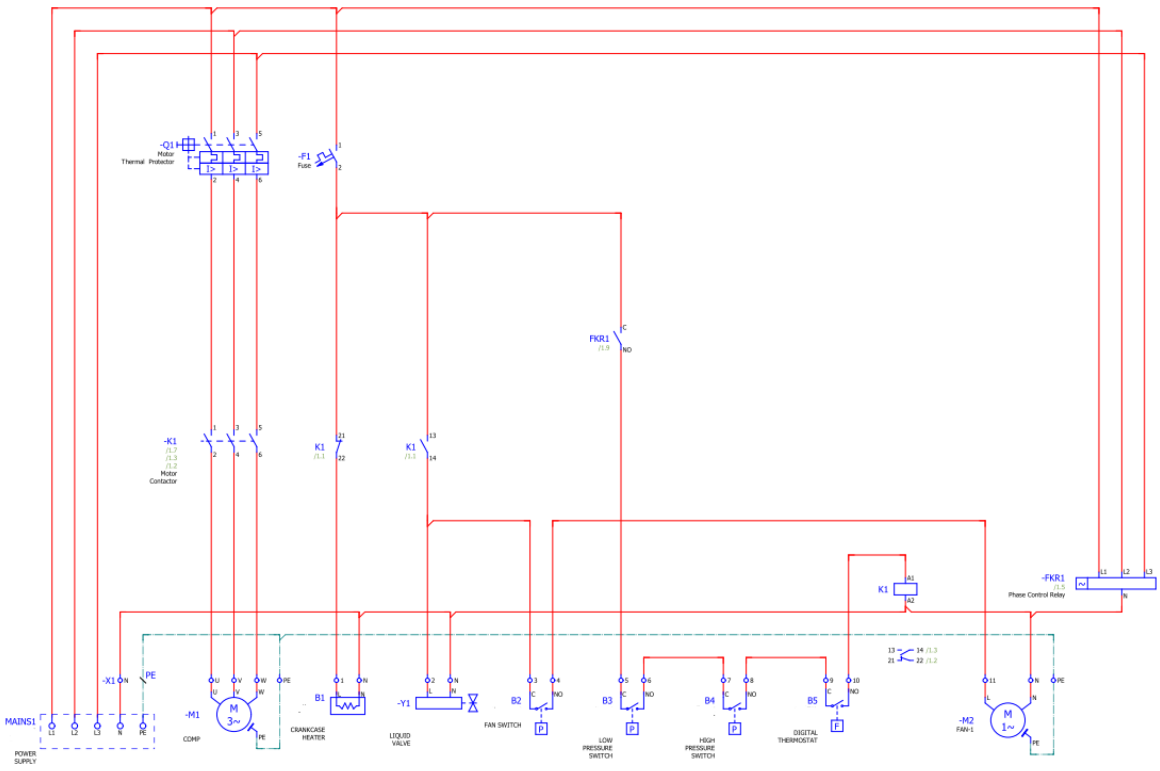
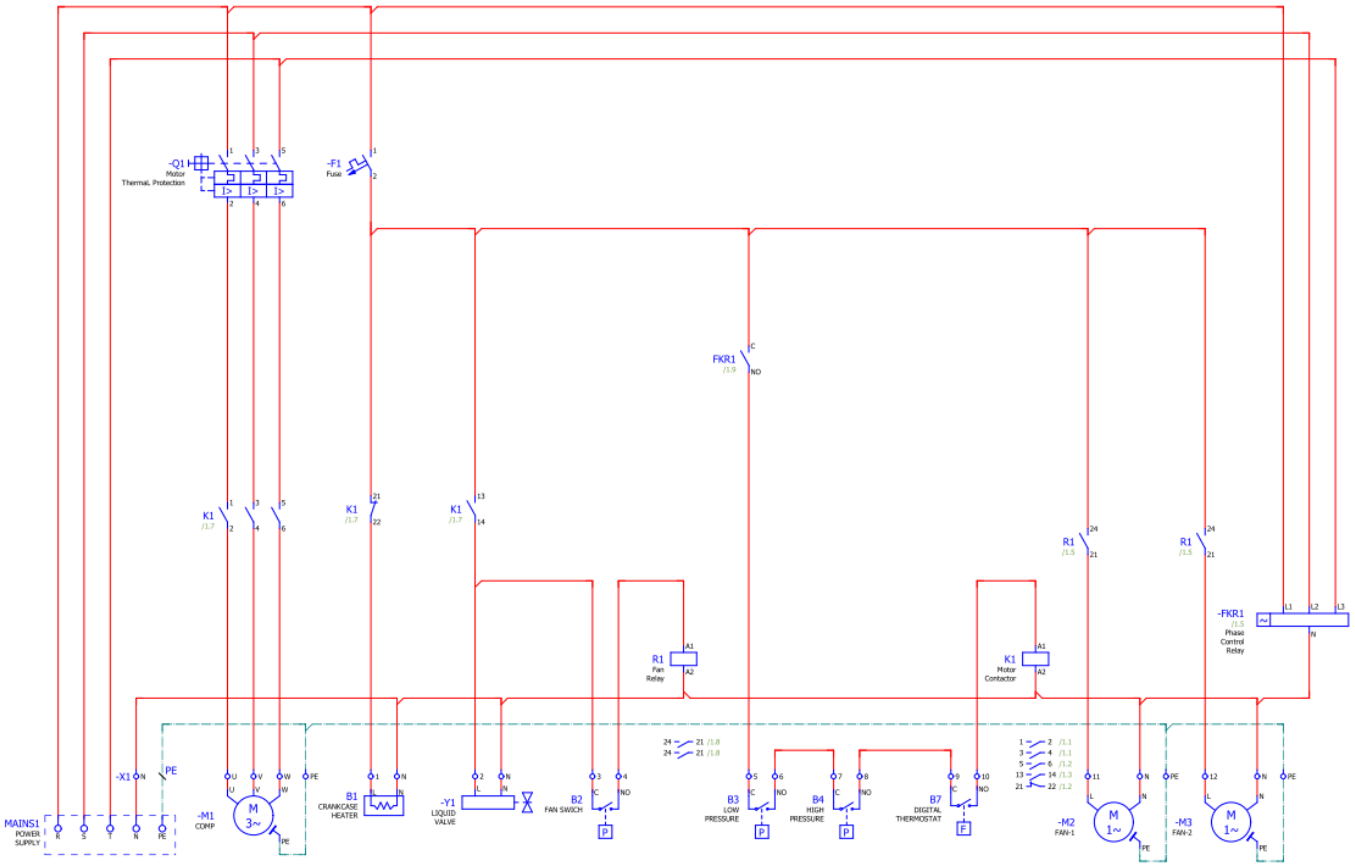


Figure 6: Three phase Split Hermetics Condensing Units with 2 Fans



With Full Optional Equipment's

Figure 7: Monophase Split Hermetic Condensing Units with 1 Fan

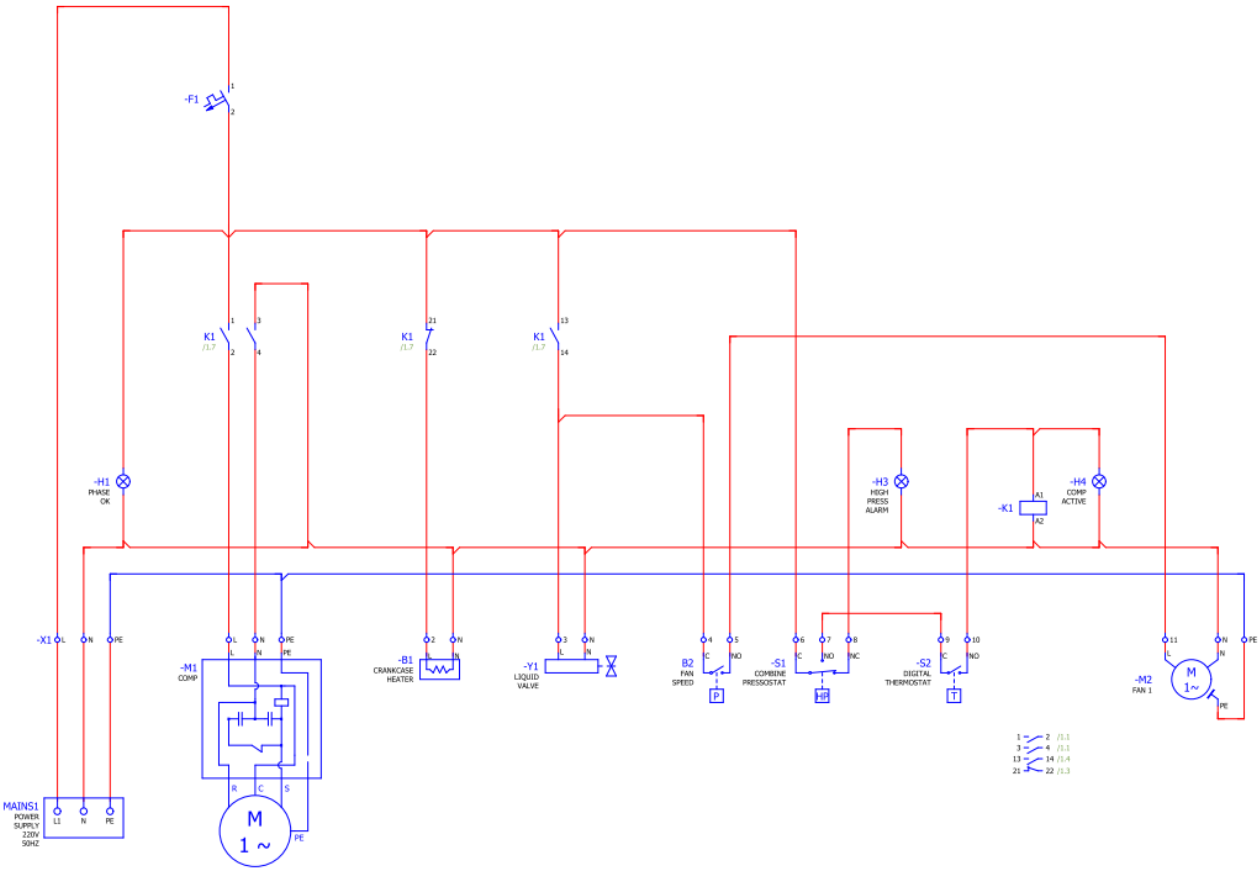


Figure 8: Three phase Split Hermetic Condensing Units with 1 Fan

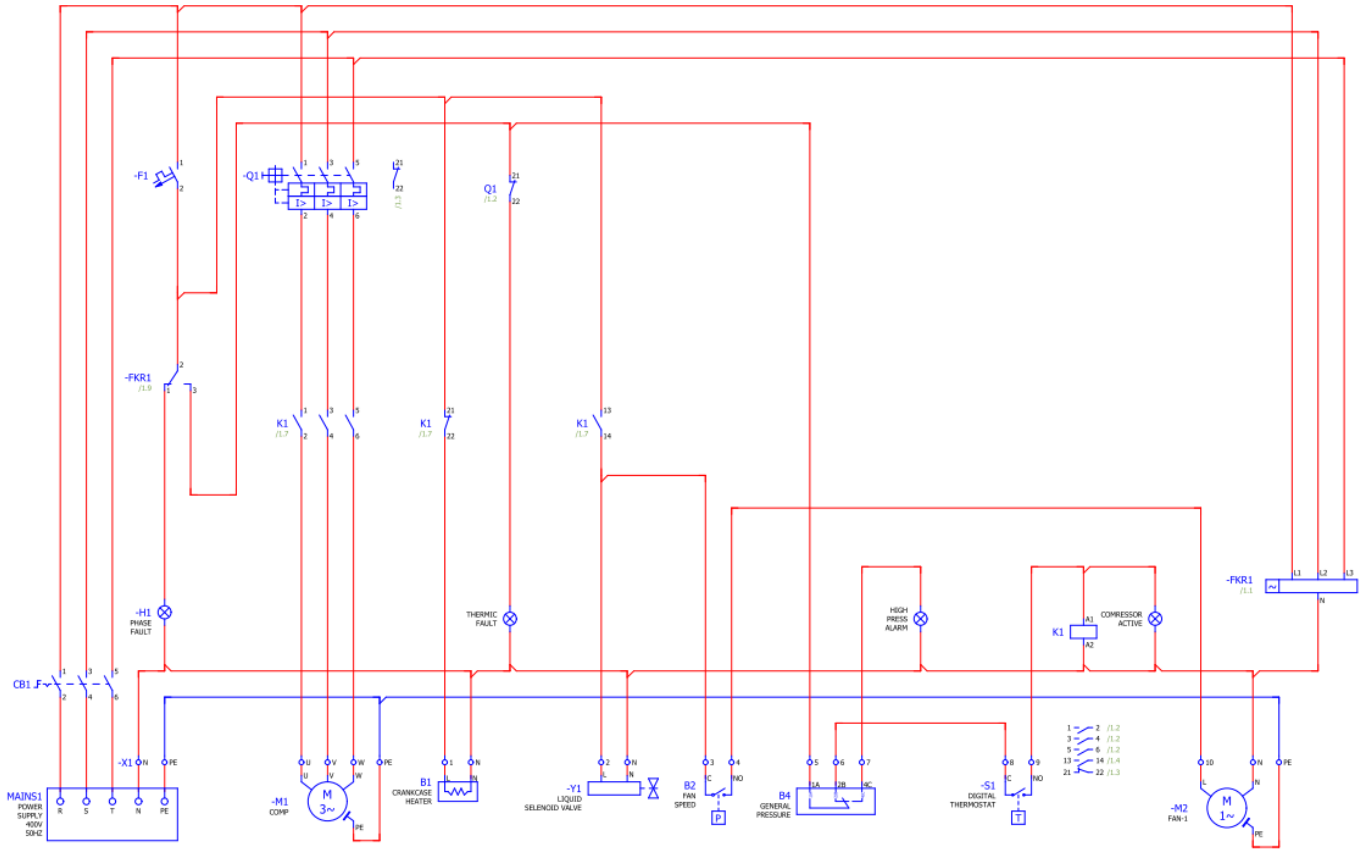
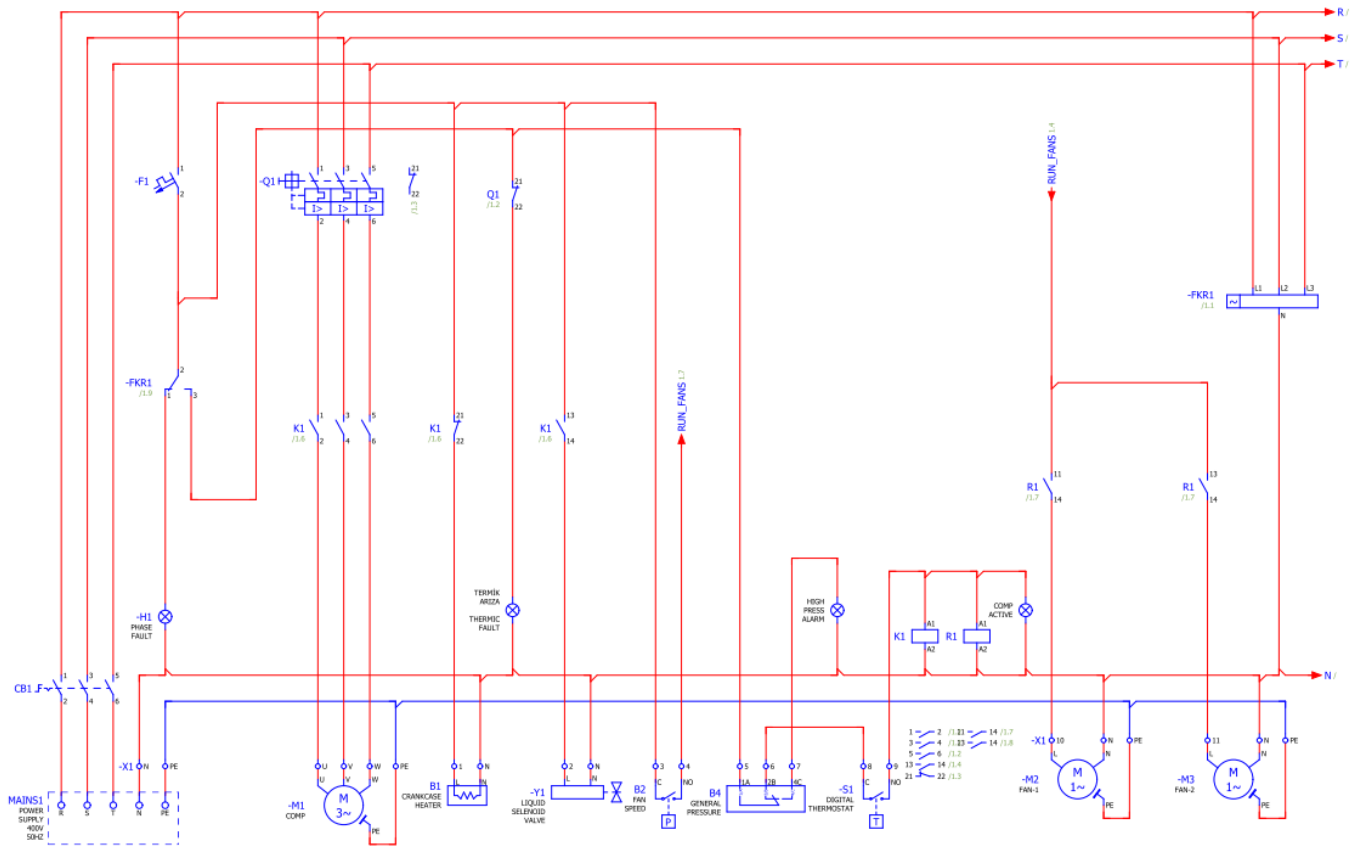


Figure 9: Three phase Split Hermetic Condensing Units with 2 Fans



CABIN

Cabin Lists

The cabinet types used for IBS Condensing Units with the optional oil separator and suction accumulator are listed below.

Cabinet drawings and their dimensions are provided after the tables

Table 14: Standard Series

			1400 RPM				
Brand	**Model**	**IBS Model**	**Condenser Surf. Area**	**Standard Cabin**	**If Oil Separator Added**	**If Suction Accumulator Added**	**If Oil Sep.+ Suction Accu. Added**
Danfoss	MTZ 022	ICF-1HM11-M6.0Z4	15	F1 00	F1 30	F1 30	F1 30
Danfoss	MTZ 028	ICF-1HM11-M8.0Z4	15	F1 00	F1 30	F1 30	F1 30
Danfoss	MTZ 032	ICF-1HM11-MX10Z4	20	F1 00	F1 30	F1 30	F1 30
Danfoss	MTZ 036	ICF-3HM11-MX11Z4	28	F3 20	F3 20	F3 20	F3 24
Danfoss	MTZ 040	ICF-3HM11-MX12Z4	28	F3 20	F3 20	F3 20	F3 24
Danfoss	MTZ 050	ICF-3HM11-MX15Z4	28	F3 24	F3 24	F3 24	F3 44
Danfoss	MTZ 056	ICF-3HM11-MX17Z4	37	F3 24	F3 24	F3 24	F3 44
Danfoss	MTZ 064	ICF-4HM12-MX19Z4	44	F4 22	F4 22	F4 33	F4 33
Danfoss	MTZ 072	ICF-4HM12-MX21Z4	44	F4 22	F4 22	F4 33	F4 33
Danfoss	NTZ 048	ICF-1HL11-M8.0Z4	9	F0 01	F0 32	F0 32	F0 32
Danfoss	NTZ 068	ICF-1HL11-MX12Z4	20	F1 00	F1 30	F1 30	F1 30
Danfoss	NTZ 096	ICF-3HL11-MX17Z4	28	F3 24	F3 24	F3 24	F3 44
Danfoss	NTZ 108	ICF-3HL11-MX18Z4	28	F3 24	F3 24	F3 24	F3 44
Danfoss	NTZ 136	ICF-3HL11-MX24Z4	37	F3 24	F3 24	F3 24	F3 44
Tecumseh	CAJ 2446Z	ICF-0HM11-T4.6Z4	6	F0 11	F0 32	F0 32	F0 32
Tecumseh	CAJ 2464Z	ICF-1HM11-T6.1Z4	9	F0 11	F0 32	F0 32	F0 32
Tecumseh	CAJ 4517Z	ICF-1HM11-T7.7Z4	9	F0 11	F0 32	F0 32	F0 32
Tecumseh	CAJ 4519Z	ICF-1HM11-TX10Z4	15	F0 11	F1 30	F1 30	F1 30
Tecumseh	FH 2480Z	ICF-3HM11-TX13Z4	15	F1 00	F1 30	F1 30	F1 30
Tecumseh	FH 2511Z	ICF-3HM11-TX16Z4	20	F1 00	F1 30	F1 30	F1 30
Tecumseh	FH 4524Z	ICF-3HM11-TX18Z4	15	F1 00	F1 30	F1 30	F1 30
Tecumseh	FH 4532Z	ICF-3HM11-TX20Z4	20	F1 00	F1 30	F1 30	F1 30
Tecumseh	FH 4538Z	ICF-4HM12-TX22Z4	28	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 2516	ICF-4HM12-TX24Z4	28	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 2522	ICF-0HL11-T4.6Z4	37	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 4546	ICF-0HL11-T6.1Z4	28	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 4553	ICF-1HL11-T9.4Z4	28	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 4561	ICF-1HL11-TX13Z4	37	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 4568	ICF-3HL11-TX20Z4	44	F4 20	F4 22	F4 22	F4 33
Tecumseh	TAG 4573	ICF-3HL11-TX24Z4	44	F4 20	F4 22	F4 22	F4 33

Table 15: Silence Series

			900 Rpm				
Brand	**Model**	**IBS Model**	**Condenser Surf. Area**	**Standard Cabin**	**If Oil Separator Added**	**If Suction Accumulator Added**	**If Oil Sep.+ Suction Accu. Added**
Danfoss	MTZ 022	ICF-1HM11-M6.0Z6	15	F1 00	F1 30	F1 30	F1 30
Danfoss	MTZ 028	ICF-3HM11-M8.0Z6	28	F3 20	F3 20	F3 20	F3 24
Danfoss	MTZ 032	ICF-3HM11-MX10Z6	28	F3 20	F3 20	F3 20	F3 24
Danfoss	MTZ 036	ICF-3HM11-MX11Z6	28	F3 20	F3 20	F3 20	F3 24
Danfoss	MTZ 040	ICF-3HM11-MX12Z6	28	F3 20	F3 20	F3 20	F3 24
Danfoss	MTZ 050	ICF-3HM11-MX15Z6	37	F3 24	F3 24	F3 24	F3 44
Danfoss	MTZ 056	ICF-4HM12-MX17Z6	44	F4 22	F4 22	F4 33	F4 33
Danfoss	MTZ 064	ICF-4HM12-MX19Z6	44	F4 22	F4 22	F4 33	F4 33
Danfoss	MTZ 072	ICF-4HM12-MX21Z6	44	F4 22	F4 22	F4 33	F4 33
Danfoss	NTZ 048	ICF-1HL11-M8.0Z6	15	F1 30	F1 30	F1 30	F1 30
Danfoss	NTZ 068	ICF-3HL11-MX12Z6	28	F3 20	F3 20	F3 20	F3 24
Danfoss	NTZ 096	ICF-3HL11-MX17Z6	28	F3 24	F3 24	F3 24	F3 44
Danfoss	NTZ 108	ICF-3HL11-MX18Z6	28	F3 24	F3 24	F3 24	F3 44
Danfoss	NTZ 136	ICF-4HL12-MX24Z6	44	F4 22	F4 22	F4 33	F4 33
Tecumseh	CAJ 2446Z	ICF-1HM11-T4.6Z6	6	F0 01	F0 32	F0 32	F0 32
Tecumseh	CAJ 2464Z	ICF-1HM11-T6.1Z6	15	F1 10	F1 30	F1 30	F1 30
Tecumseh	CAJ 4517Z	ICF-3HM11-T7.7Z6	15	F1 10	F1 30	F1 30	F1 30
Tecumseh	CAJ 4519Z	ICF-3HM11-TX10Z6	15	F1 10	F1 30	F1 30	F1 30
Tecumseh	FH 2480Z	ICF-3HM11-TX13Z6	15	F1 00	F1 30	F1 30	F1 30
Tecumseh	FH 2511Z	ICF-3HM11-TX16Z6	28	F3 20	F3 20	F3 20	F3 24
Tecumseh	FH 4524Z	ICF-3HM11-TX18Z6	28	F3 20	F3 20	F3 20	F3 24
Tecumseh	FH 4532Z	ICF-4HM12-TX20Z6	28	F3 20	F3 20	F3 20	F3 24
Tecumseh	FH 4538Z	ICF-4HM12-TX22Z6	28	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 2516	ICF-4HM12-TX24Z6	28	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 2522	ICF-0HL11-T4.6Z6	44	F4 20	F4 20	F4 22	F4 34
Tecumseh	TAG 4546	ICF-1HL11-T6.1Z6	28	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 4553	ICF-1HL11-T9.4Z6	37	F3 20	F3 24	F3 24	F3 24
Tecumseh	TAG 4561	ICF-3HL11-TX13Z6	44	F4 20	F4 22	F4 22	F4 34
Tecumseh	TAG 4568	ICF-3HL11-TX20Z6	44	F4 20	F4 22	F4 22	F4 34
Tecumseh	TAG 4573	ICF-4HL12-TX24Z6	44	F4 20	F4 22	F4 22	F4 34

Outline Drawings

Figure 10: F0 01 Cabin

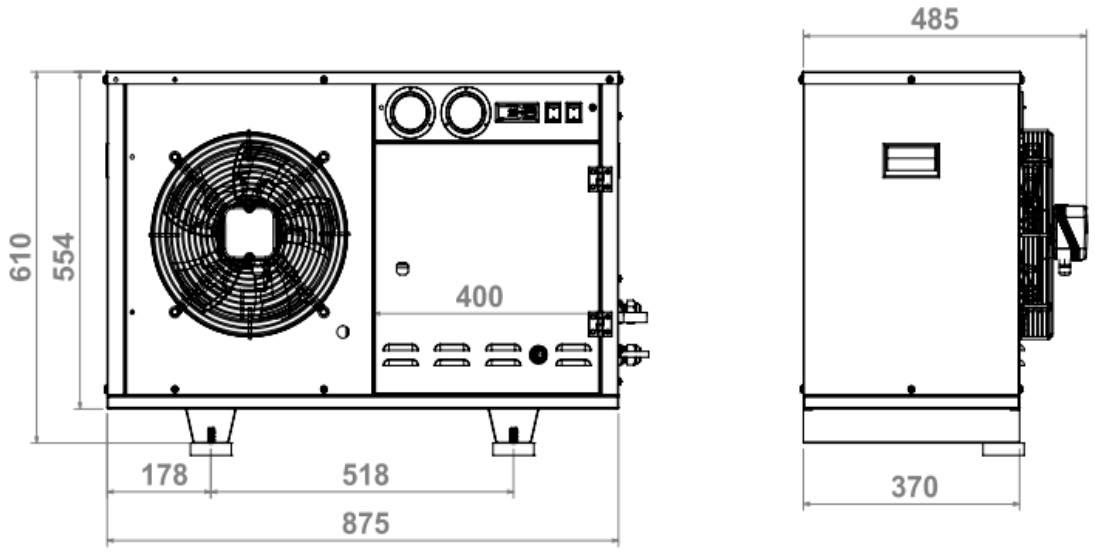


Figure 11: F0 11 Cabin

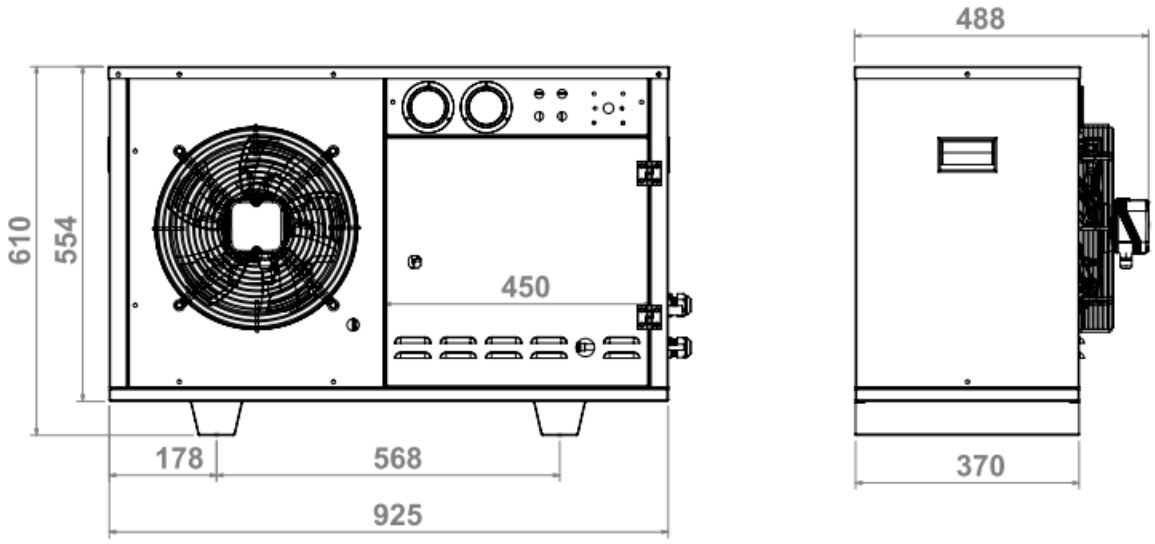


Figure 12: F0 32 Cabin

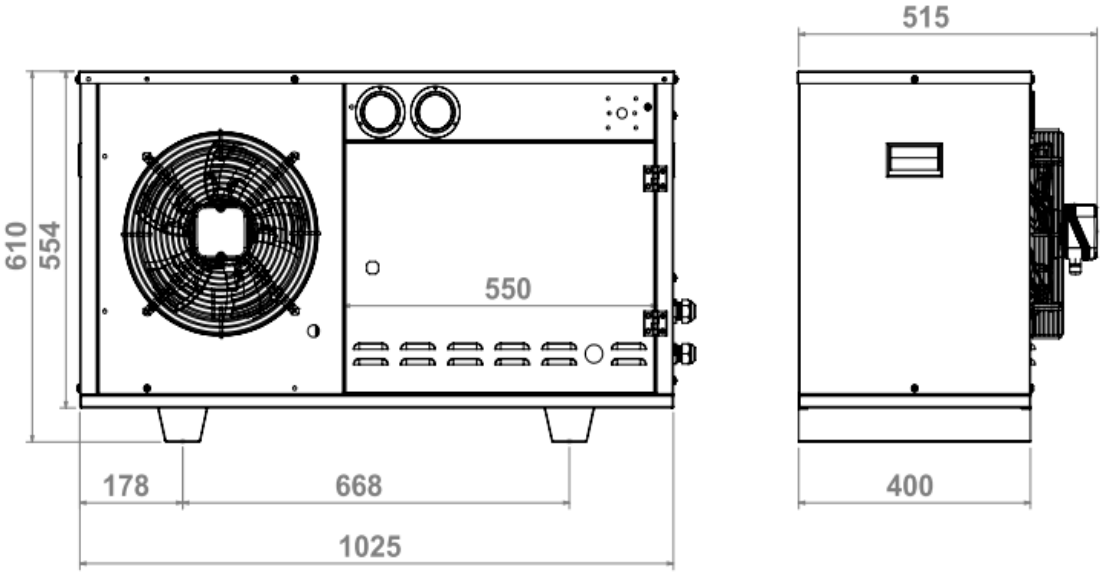


Figure 13: F1 00 Cabin

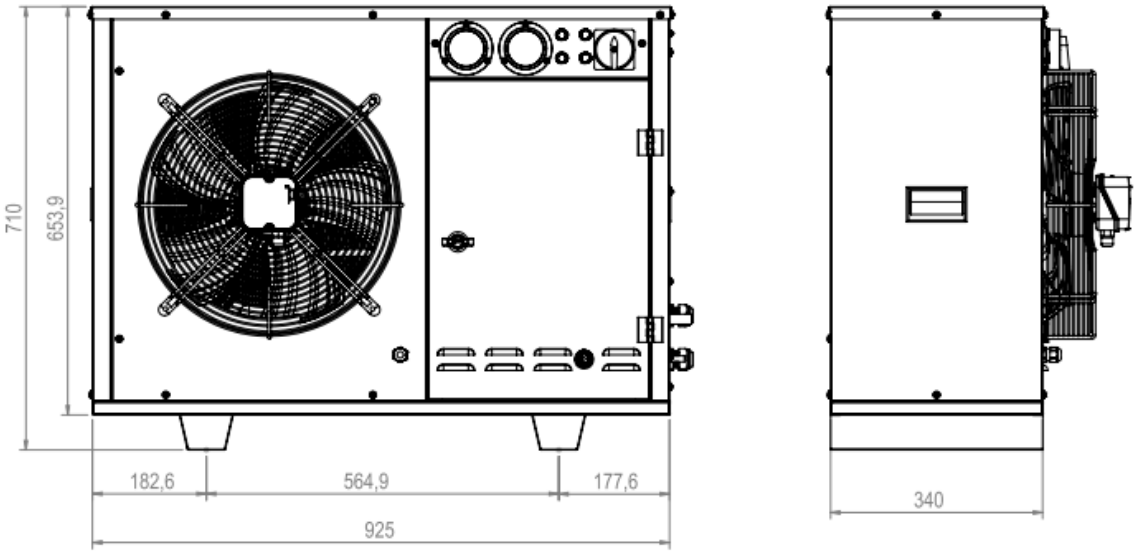


Figure 14: F1 10 Cabin

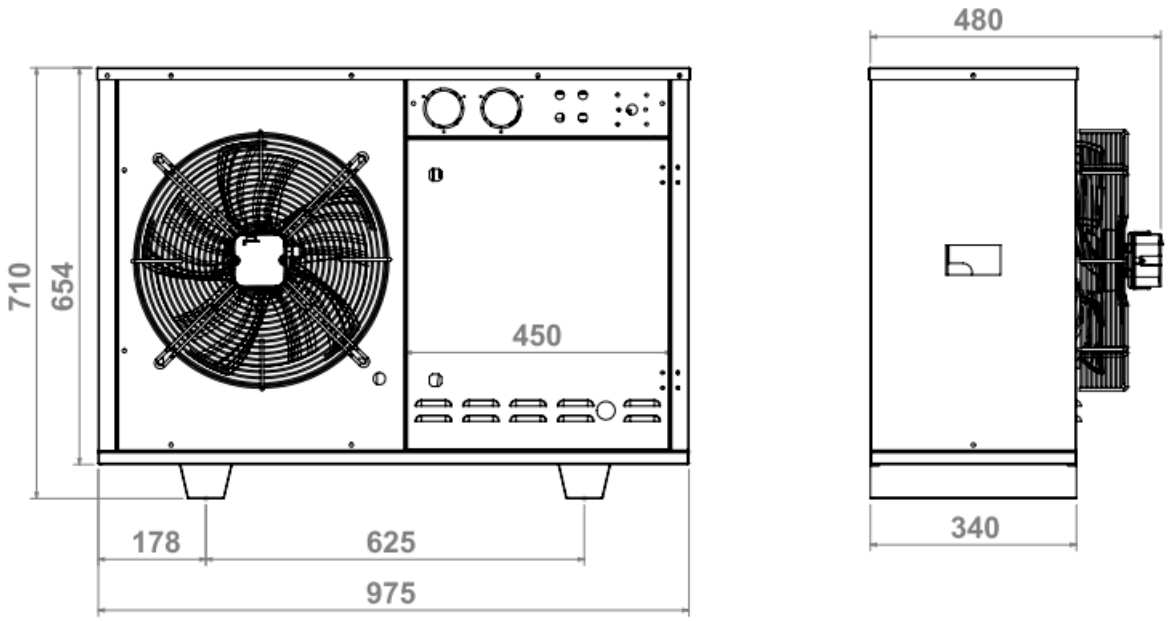


Figure 15: F1 30 Cabin

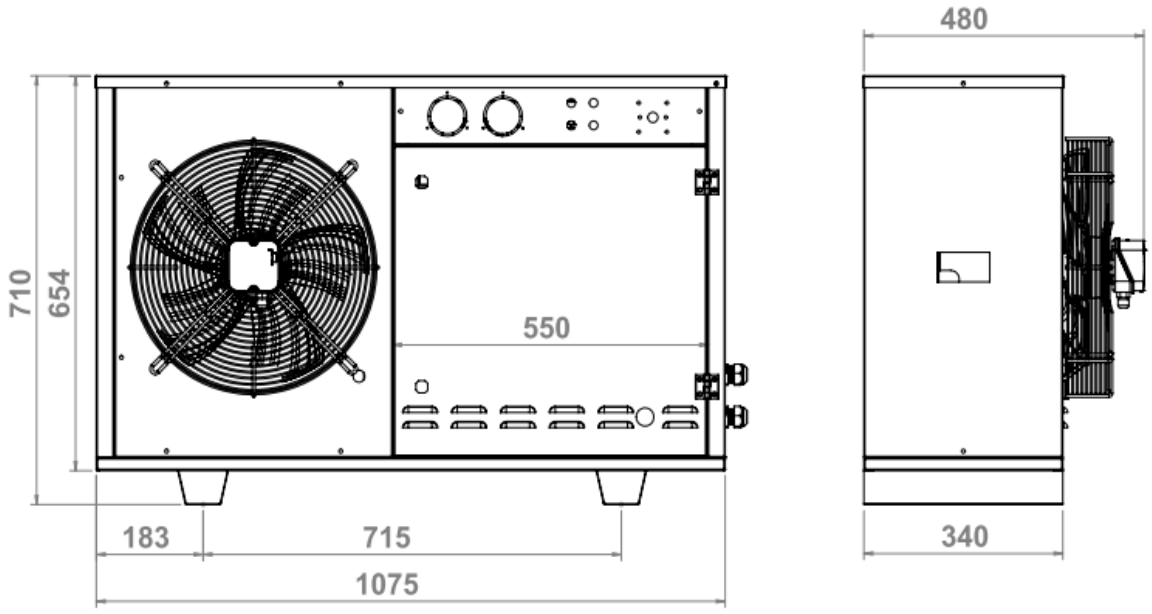


Figure 16: F3 20 Cabin

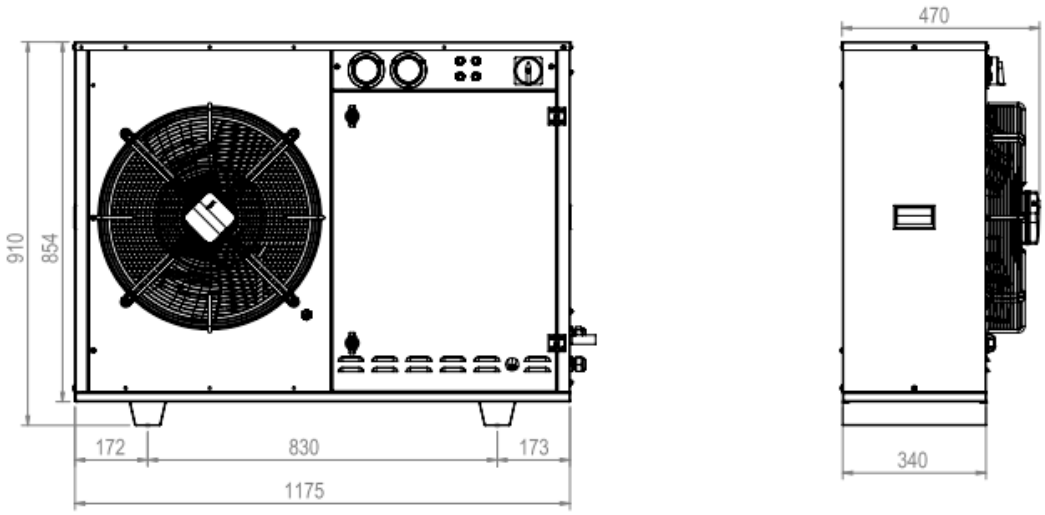


Figure 17: F3 24 Cabin

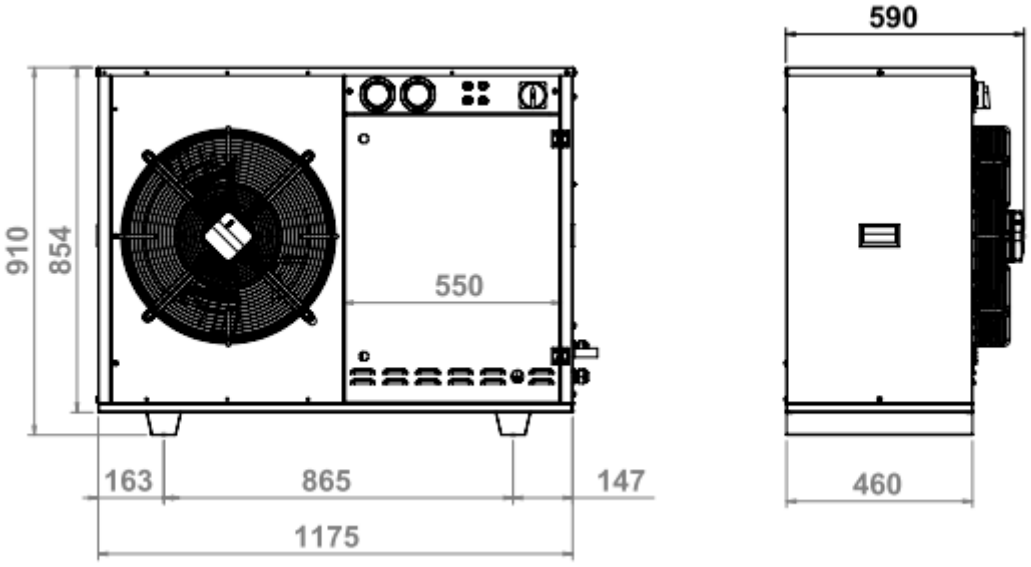


Figure 18: F3 44 Cabin

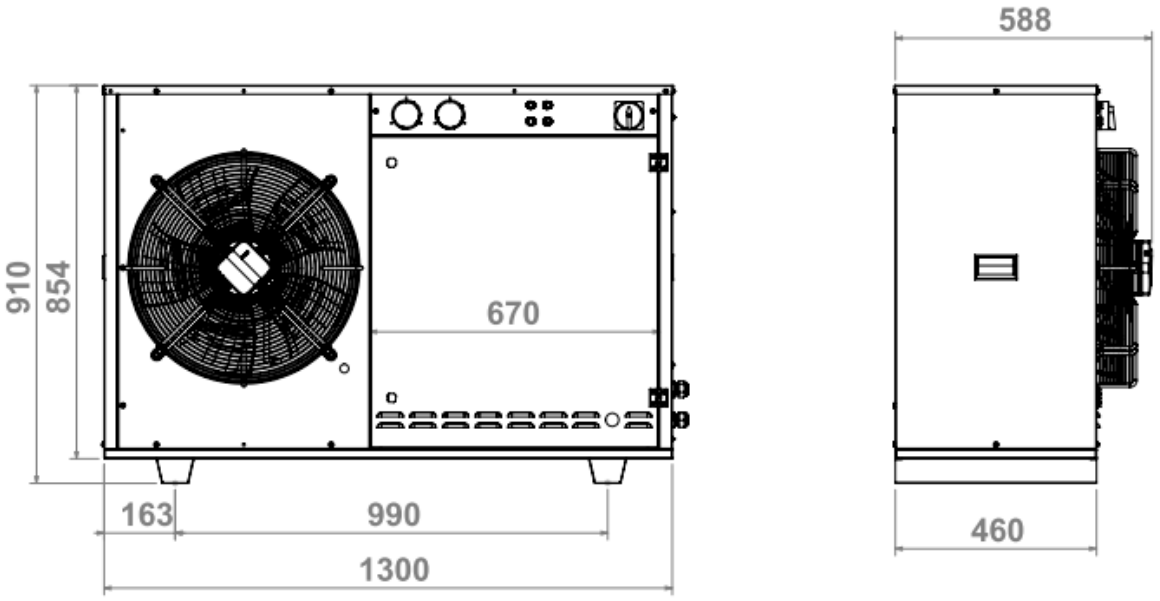


Figure 19: F4 20 Cabin

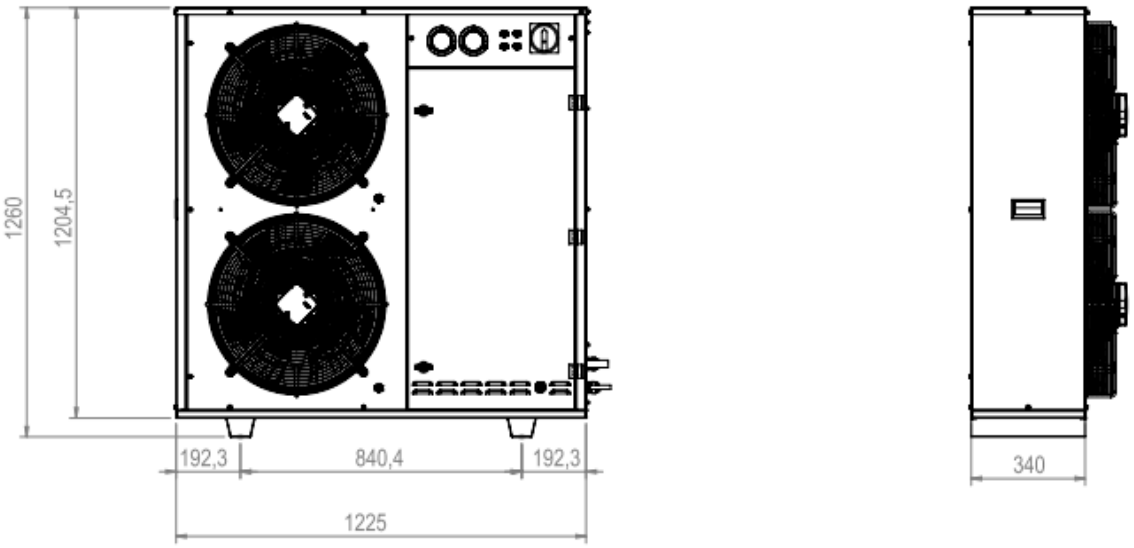


Figure 20: F4 22 Cabin

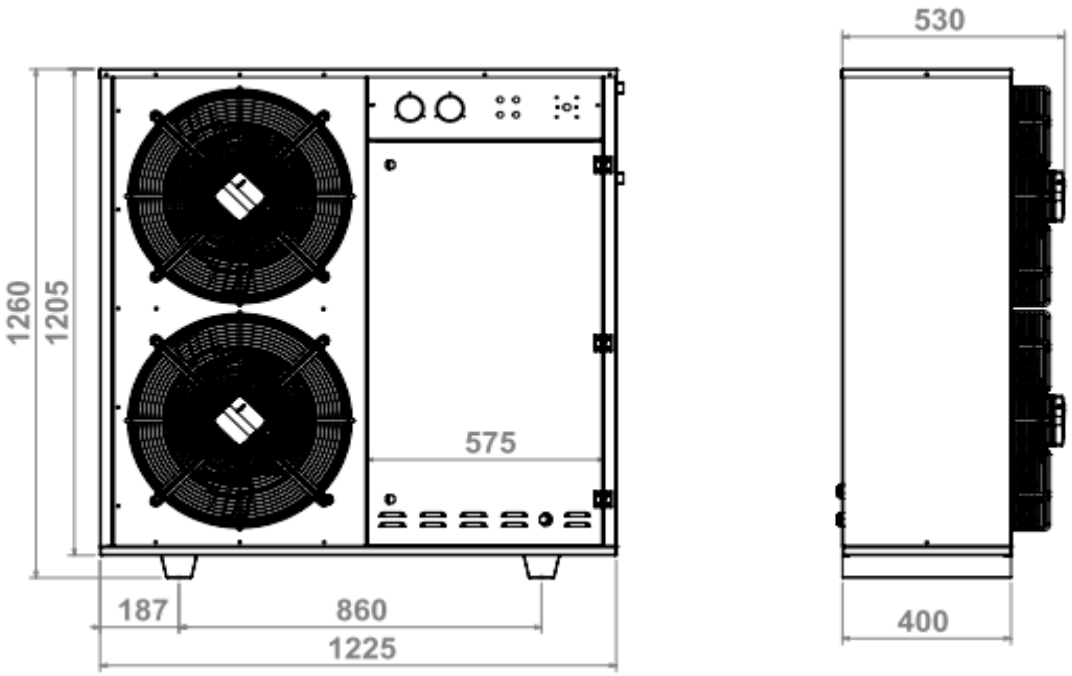


Figure 21: F4 33 Cabin

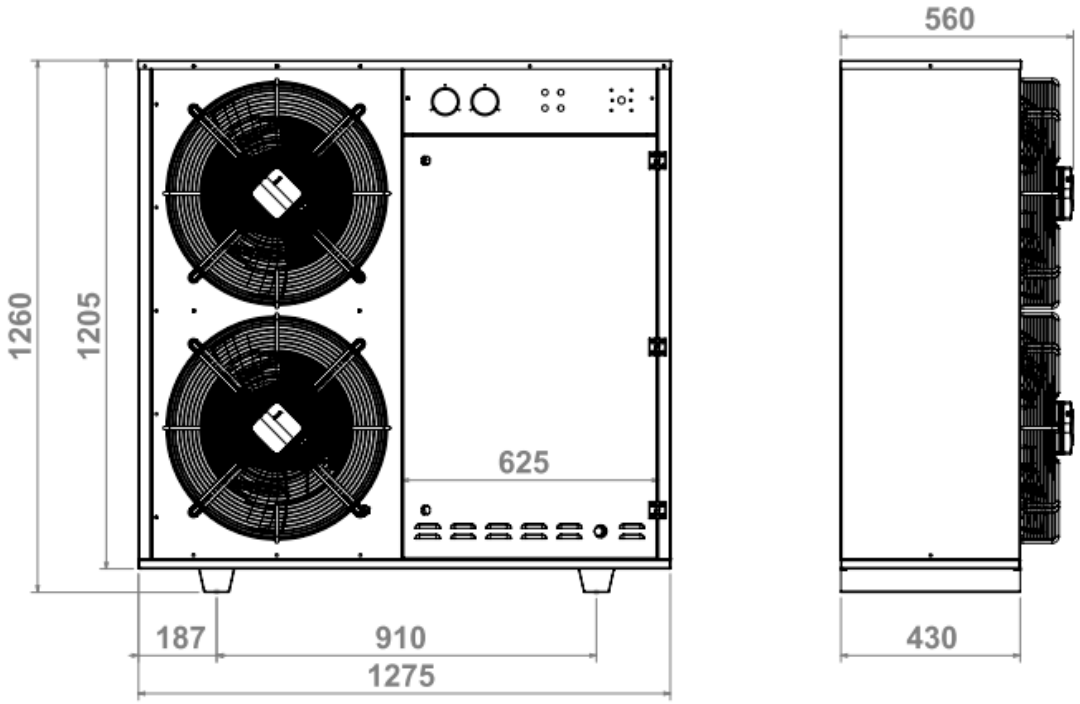
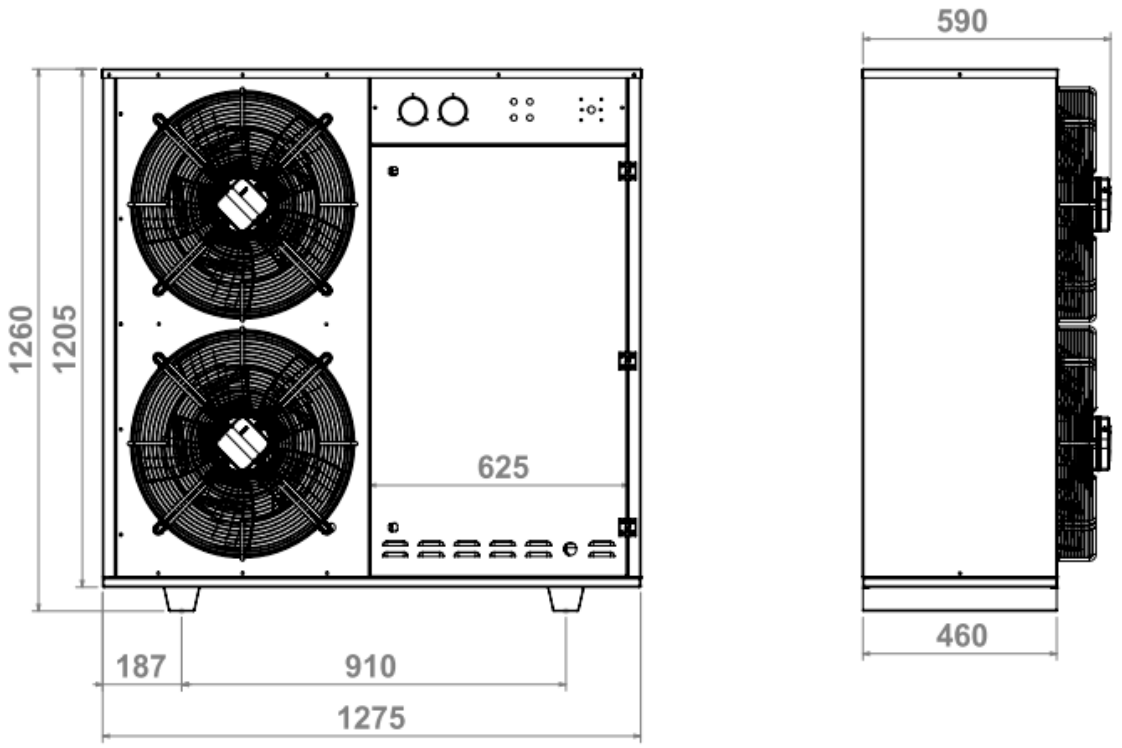


Figure 22: F4 34 Cabin



TROUBLE SHOOTING

You can find Trouble shooting table which includes Problems, Causes and Solutions. It's important to note that many problems require solutions beyond the user's capabilities. Such problems can be solved by authorized service personnel with good equipment. Try to solve the problems according to the instructions below. Remember that continuing to operate the unit without resolving the problems may lead to permanent damage in the future. If you cannot solve the problems yourself, please contact your nearest service provider.

PROBLEM	POSSIBLE CAUSE	CHECK	SOLUTIONS
COMPRESSOR			
Compressor will not starting	Power Supply	Phase(s) and neutral present?	Check/rectify
		Voltage within tolerance?	Check/rectify
		Is isolator switched on?	If not - switch on
	Compressor contactor not pulled in (where fitted)	Is there correct voltage to contactor coil?	If yes - coil faulty. Replace contactor/coil
			If no - check for break in control circuit or blown control fuse.
		Has a safety switch tripped out?	Check cause and reset
	Compressor contactor pulled in but compressor not running	Is voltage being switched across contactor?	If yes - check voltage at compressor terminals and compressor wiring
			If no - Replace the faulty contactor
	Safety switch tripped (LP, HP, Overload)	Low and High pressure conditions and current draw on overload. Check settings of safety switches are correct.	Reset and rectify any abnormal conditions or adjust switch settings if not set correctly
	Compressor internal overload tripped	Is the correct voltage at compressor terminals?	Compressor has overheated -allow time for reset (up to 3 hours) and rectify cause
	Control fuse blown in panel		Replace fuse and test - rectify fault
	Starting kit faulty (single phase units only)	Check relay operation and contacts and inspect start/run capacitors	Replace as necessary
	Motor windings faulty	Check resistances of windings against manufacturer values	Windings that show open circuit could be due to internal overload trip. Wait for reset and recheck. If continually open circuit - motor faulty. Replace compressor.
	Compressor seized	Does compressor attempt to start but does not run correctly (makes humming sound)? Are amps equivalent to LRC rating?	If all electrical checks on components as above are OK -Change compressor
Compressor runs but no effect on suction/discharge pressures	Mechanical failure	Are compressor motor amps lower than expected? If so - potentially valve reeds damaged or other internal wear/damage	Try pump test on compressor. If test fails - replace compressor.
	(For three-phase scroll compressors only)	The compressor may be running backwards - the compressor will also be noisier than normal	Swap any two of the incoming phases to the isolator switch and recheck.

Compressor starts and stops too quickly	Operating on safety switches	Check LP & HP settings - is the LP differential too small or the HP setting too low?	Check and adjust switch settings.
			Check all valves are in open position
	Refrigerant levels	Is there too little refrigerant in the system causing rapid LP tripping or too much refrigerant in the system causing HP tripping?	Check refrigerant level and adjust accordingly
	Faulty contactor (if fitted)	Are the contacts chattering on the contactor?	Contacts may be dirty or worn.
			Check and replace contactor as necessary
	Loose / broken wiring connection		Make sure all electrical connections are sound
Compressor is noisy	Vibration	Rubber feet mountings worn or bolts are loose/missing	Replace mountings and tighten/replace bolts as necessary
	Lack of oil	Check oil sight glass to see if level below recommended level	Top up with oil as necessary
	Too much oil	Check oil sight glass to see if level above recommended level	Remove oil overcharge
	Liquid refrigerant	Does compressor 'knock' when starting up or running? Liquid refrigerant may be present in oil and compression chambers	Identify cause of liquid return to compressor and rectify
	Overloaded	Are suction and discharge pressures too high? There may be too much load on the compressor.	Identify cause of increased load and rectify
	High discharge pressure	Blocked condenser / faulty condenser fan	Check and rectify
		Refrigerant overcharge	Check and rectify
		Non-condensable in system	Reclaim refrigerant, evacuate & recharge
	Internal wear / damage	Noise is always present even if all operating conditions are, OK?	Replace compressor
Compressor body too hot	System load too high	Are suction and discharge pressures high?	Reduce load at evaporator
	High discharge pressure	Blocked condenser / faulty condenser fan	Check and rectify
	Lack of compressor cooling	Suction superheat too high	Check refrigerant charge correct
			Check TEV superheat setting correct
			Is suction line correctly insulated?
	Compressor starting too frequently	Are controls set correctly - is the differential on thermostat or LP switch too small?	Check and adjust
		Is the liquid line solenoid valve allowing refrigerant to pass when closed?	Check valve and clean seat or replace as necessary if damaged
	Discharge gas bleeding into suction side	Does suction pressure rise abnormally when compressor stops or compressor fails to pump down correctly?	Compressor valve reeds may be damaged - replace compressor
SYSTEM			
Insufficient cooling	Lack of refrigerant	Is sight glass flashing continuously?	Leak test system and top up with refrigerant
	Condenser coil dirty	Visual check of coil condition	Clean condenser coil
	Lack of ventilation to unit	Any obstructions around unit?	Clear same to ensure good ventilation
	Compressor not pumping efficiently	Carry out pump test on compressor	Replace compressor if fails pump test
	System settings	Controls (inc thermostat) set correctly?	Adjust as necessary
		T.E.V. Superheat	Adjust as necessary
	Service valves do not open correctly	Are valves fully open?	Adjust as necessary
	Restriction in piping/component	Is the filter drier blocked? Sweating/frosting on outlet of drier indicates a blockage	Replace filter drier
		Damage to piping	Replace piping as required

CONDENSER FAN			
Condenser fan will not run	Power supply	See compressor will not start section	See compressor will not start section
	Compressor contactor not pulled in	See compressor will not start section	See compressor will not start section
	Compressor contactor pulled in	Is voltage being switched across contactor?	If yes - check voltage to FSC and to fan motor. If correct voltage present at motor - fan faulty. Replace fan
			If no. Replace faulty contactor
	Being controlled by FSC (if fitted)	Is system operating pressure below FSC setting?	If yes - all OK (check fan operates when pressure rises)
	Fan capacitor fault	Check visual condition of capacitor and check capacitance reading with capacitor meter.	Replace capacitor if required
	Motor fault	If FSC fitted - bypass FSC to test motor. If motor still does not run -motor is faulty	Replace motor
Condenser fan runs but only slowly	Is fan being controlled by FSC?	Is head pressure under control (~14/15 bar on R448A/449A) and fan speed increases as head pressure rises?	All OK
		Is head pressure above 16 bar (R448/449A)?	Check setting of FSC. Adjust if necessary.
	FSC faulty	If fan runs slowly even after adjusting FSC with head pressure rising - FSC may be faulty	Change FSC

CERTIFICATES

2006/42/EC Machinery Directive

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TÜV AUSTRIA

CERTIFICATE

Certificate - No.: 23-IS-2138-TAT-24-MAD-0313

Applicant	:	IBS SOĞUTMA ISITMA HAVALANDIRMA TAAHHÜT SAN. VE TİC. A.Ş. Organize Sanayi Bölgesi 2. Cadde No:39 Y.Dudullu/İSTANBUL
Product	:	Condensing Units, Evaporators
Type(s)	:	# Split Type, Industrial Type, Open Type, Standard Type, Ceiling Type, Blast Freezer Type #
Model(s)	:	# ICF Series, ICE Series,ICC Series, ICO Series, ICV Series, ICB Series, ICD Series, ICS Series, ICT Series #
Standard(s) / Certification Basis	:	2006/42/EC Machinery Directive EN ISO 12100:2010 EN 60204-1:2018

This Certificate is issued on a voluntary basis according to Machinery Directive 2006/42/EC.
It conforms that the listed equipment complies with the essential safety requirements of the directive.
It refers only to the sample and its technical file submitted for conformity assessment.

Reference Inspection Report No	:	23-IS-2138-UDR-01
First Issue Date	:	06.05.2024
Date of Revision	:	06.01.2026
Expiry Date	:	05.05.2029

The certificate is valid as long as the standards and legislation are current and annual audit is performed with satisfactory results.

For and behalf of
TÜV AUSTRIA TURK Belgelendirme
Eğitim ve Gözetim Hizmetleri Ltd.Şti.
Emrah Ümit ŞİRANLI

After preparation of the necessary technical documentation as well as the declaration of conformity the required CE marking can be affixed on the product. Other relevant directives have to be observed.

This Certificate has been granted to the applicant based on the results of testing performed by the applicant/manufacturer or an accepted laboratory and the consequent review of the test report by TÜV AUSTRIA TURK. Revisions to the referenced certification basis or any change of the design, materials, components or processing may require the repetition of all or some of the qualification tests in order for the test report and therefore this associated certificate to remain valid.

TÜV AUSTRIA TURK
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All testing inspection and surveillance activities were carried out in accordance with the QM system of TÜV AUSTRIA TURK

Çamlık Mah. İkbal Cad.
Dinç Sk. No:26 PK:34774
Ümraniye / İSTANBUL
E-mail: infoturkey@tuv.at

ISO 9001:2015

NAVIGA CERTIFICATION

SERTİFİKA
CERTIFICATE OF REGISTRATION

Bu sertifika aşağıdaki kuruluşa
This certificate has been awarded to the company

IBS ISITMA SOĞUTMA HAVALANDIRMA TAAHHÜT SANAYİ VE TİCARET ANONİM ŞİRKETİ

Dudullu Organize Sanayi Bölgesi 2. Cadde No:39 Y.Dudullu 34775 Ümraniye, İSTANBUL

Uygulanmakta olan Kalite yönetim sisteminin
To certify that the implemented Quality management system complies with

ISO 9001:2015

Standardına uygunluğunu belgelendirmek amacı ile aşağıdaki kapsamda verilmiştir.
For the activities described below

ISITMA, SOĞUTMA, HAVALANDIRMA SİSTEMLERİNİN TASARIM, ÜRETİM, SATIŞ, TAAHHÜT, SERVİS VE BAKIMI

DESIGN, MANUFACTURING, TRADING, CONTRACTING, SERVICE AND MAINTENANCE OF HEATING, COOLING AND VENTILATION SYSTEMS

Sertifika No / *Certificate No*	: 1840214
İlk Belgelendirme Tarihi / *Initial Certification Date*	: 22.03.2018
Sertifika Tarihi / *Date of Certificate*	: 25.05.2025
** **Geçerlilik Tarihi** / ***Validity Date***	: **21.03.2026**
3 Yıllık Çevrim Bitiş Tarihi / *3 Year Cycle End Date*	: 21.03.2027

İstanbul, 25.05.2025 (Rev.07)

IAF SEARCH

TÜRKAK BDS NO YS-0067-7B19

İşbu sertifika, Naviga'nın prosedür, talimatlarına ve yukarıdaki standardın gerekliliklerine ve düzenli olarak yapılacak gözetim denetimlerinin başarı ile tamamlanmasına bağlı olarak, yukarıdaki adres ve kapsam dahilinde geçerlidir
**Bir sonraki denetimin başarılı bir şekilde tamamlanması durumunda, sertifika yenilenecektir.
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This certificate is valid for above address(es) and scope upon compliance with Naviga procedure(s), instruction(s) and the above mentioned standard and successful completion of regular surveillance audits.
Upon successful completion of the next audit, the certificate will be renewed.
The validity of this certificate can be checked through QR code by TURKAK database or TBDS certificate no. under QR code on https://tbds.turkak.org.tr webpage.

NAVIGA ULUSLARARASI BELGELENDİRME VE EĞİTİM HİZMETLERİ LTD. ŞTİ.
Yenibosna Merkez Mah. Çınar Cad. Güneşli Matbaa Sitesi No:4 İç Kapı No:213 Bahçelievler/İSTANBUL
Tel: 0212 482 9656 Fax: 0212 482 9424 www.navigaltd.com - info@navigaltd.com

FR.069/Rev.05/02.01.2025

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CE Declaration of Conformity

IBS Cooling Systems

CE

CE DECLARATION OF CONFORMITY

The item of equipments which identified below has been subject to internal manufacturing checks with monitoring of the final assessment by **IBS ISITMA SOĞUTMA HAVALANDIRMA TAAHHÜT SANAYİ VE TİC. A.Ş.**

Unit	:	**Condensing, Central System Cooling, Chiller, Evaporator**
Type	:	**Split, Industrial, Open, Standard, Screw, MidiPack, MaxiPack, MidiChill, MaxiChill, UltraChill**
Serial	:	**ICF, ICE, ICC, ICO, ICV, IMC, IMV, IMW, IMS, IMO, ISS, ISV, ISW**
Identification No	:	

The undersigned declares that the described products meet the essential requirements of the below mentioned standards as based on Machinery Directive **2006/42/EC** and Low Voltage Directive **2014/35/EU**.

APPLICABLE DIRECTIVES:

2006/42/EC	:	**MACHINERY DIRECTIVE**
2014/35/EU	:	**LOW VOLTAGE DIRECTIVE**

APPLICABLE HARMONISED STANDARDS:

EN ISO 12100:2010

EN 60204-1:2018

SIGNED ON BE HALF OF THE MANUFACTURER

NAME	:	ERKAN BİRİNCİ
POSITION	:	GENERAL MANAGER
PLACE/ DATE	:	İSTANBUL / 2026
SIGNATURE	:	

IBS Isıtma Soğutma Havalandırma Kurutma Sanayi ve Tic.A.Ş.
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Organize Sanayi Bölgesi 2 Cad No 39
Yukarı Dudullu Ümraniye / İSTANBUL
Tel +90 216 466 04 05 Fax +90 216 466 05 70
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TÜV AUSTRIA

EU-Baumusterprüfbescheinigung
EU-type examination certificate

Modul B: EU-Baumusterprüfung (Baumuster) nach Richtlinie 2014/68/EU
Module B: EU-type examination - production type according to Directive 2014/68/EU

Bescheinigung Nr.: 2024 – TATR - 263-22-IS-1995
Certificate No.:

Hersteller / *manufacturer:*
IBS Isıtma Soğutma Havalandırma Taahhüt
Sanayi ve Tic. A. Ş Organize Sanayi Bölgesi 2.Cadde. No:39
Y.Dudullu/İstanbul / TÜRKİYE

Hiermit wird bescheinigt, dass die Ergebnisse der an dem unten genannten Druckgerät vorgenommenen Prüfungen die Anforderungen der Richtlinie 2014/68/EU erfüllen. Die Zertifizierungsentscheidung wurde vom Unterzeichner auf Basis einer unparteilichen Bewertung der Evaluierung getroffen.
This is to certify that the results of the examination of the pressure equipment mentioned below meet the requirements of the directive 2014/68/EU. The certification decision was made by the signee on the basis of an impartial review of the evaluation.

Diese Bescheinigung ist gültig bis zum 18.3.2034
This certificate is valid through 18 Mar 2034

Objekt:
Object: Baugruppe / *assembly*

Benennung:
Description: MANUFACTURING AND SIMPLE ASSEMBLIES OF COLLING UNIT ICF-ICE SM GRUP & IMC VDL1Y & ISS-SS01 GRUP & KF GRUP PACK+SCROLL GRUP&PACK+SM GRUP&ICF HM-CM GRUP

Inspektionsbericht Nr.:
Inspection report no.: 22-IS-1995-PED-24-IR-01

ISTANBUL
Ort / *place:*

18.03.2024
Datum / *date:*

HAKİM ÖZLÜK
Notifizierte Stelle / *notified body 0408*
TÜV AUSTRIA GMBH

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TÜV AUSTRIA

CERTIFICATE

Certificate registration number: ZSTS/SWZE/6141

The notified body
TÜV AUSTRIA GMBH (identification number 0408)
certifies, that the manufacturer

IBS Isıtma Soğutma Havalandırma Taahhüt Sanayi ve Tic. A. Ş
Organize Sanayi Bölgesi 2.Cadde. No:39 Y.Dudullu/İstanbul / TÜRKİYE

operates a quality assurance system for design, manufacture, final inspection and testing according to Annex III of the Pressure Equipment Directive 2014/68/EU which is subject to surveillance by TÜV AUSTRIA GMBH and is therefore authorized to apply the following conformity assessment procedures according Pressure Equipment Directive 2014/68/EU:

Modules E, E1, D and D1

Scope: **MANUFACTURING AND SIMPLE ASSEMBLIES OF COLLING UNIT ICF-ICE SM GRUP & IMC VDL1Y & ISS-SS01 GRUP & KF GRUP PACK+SCROLL GRUP&PACK+SM GRUP&ICF HM-CM GRUP**

Based on our audit carried out on April 24, 2024 in accordance with Annex III of the Pressure Equipment Directive 2014/68/EU we certify compliance with the requirements.

Results of the audit are recorded in the audit report
22-IS-1995-2024-PED-Modul D-009 dated April 24, 2024.

Pressure equipment and assemblies within the scope of this certificate shall carry the marking as illustrated:

CE 0408

This certificate is valid from April 24, 2024 to April 23, 2027 provided that the terms and conditions of the agreement with the notified body are met.

Vienna, 24.04.2024

TÜV AUSTRIA GMBH TÜV AUSTRIA

DI Martin Schwarz
Notified Body 0408
TÜV AUSTRIA GMBH

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IBS Cooling Systems

03.2026 V9