InvoTech

YSF series Semi-Hermetic Refrigeration Scroll Compressor

Special Design For Lower Temperature Application

It is the outstanding engineering capability that builds the incomparable reliability

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InvoTech Scroll Technologies Co., Ltd.
is a high-tech company.

Our company is founded by a group of engineers who formerly worked for the world's largest manufacturer of scroll compressors. We are a team of passionate and highly qualified professionals with more than 15 years of experience in this industry. Our company's products in addition to impressive sales performance in the domestic market, also sales to Asia, Africa, Europe, South America and other more than 30 countries and regions.

Our company provides specialized scroll compressors and related technical consulting services for heat pump water heaters, refrigeration and air conditioning, chillers and other applications. We are willing to provide our customers with jointly developed or Turn-Key solutions to meet their needs.

Our vision: to become a global first class solution provider by providing innovative products for the climate and energy industries.

For more information please visit:
www.invotech.biz

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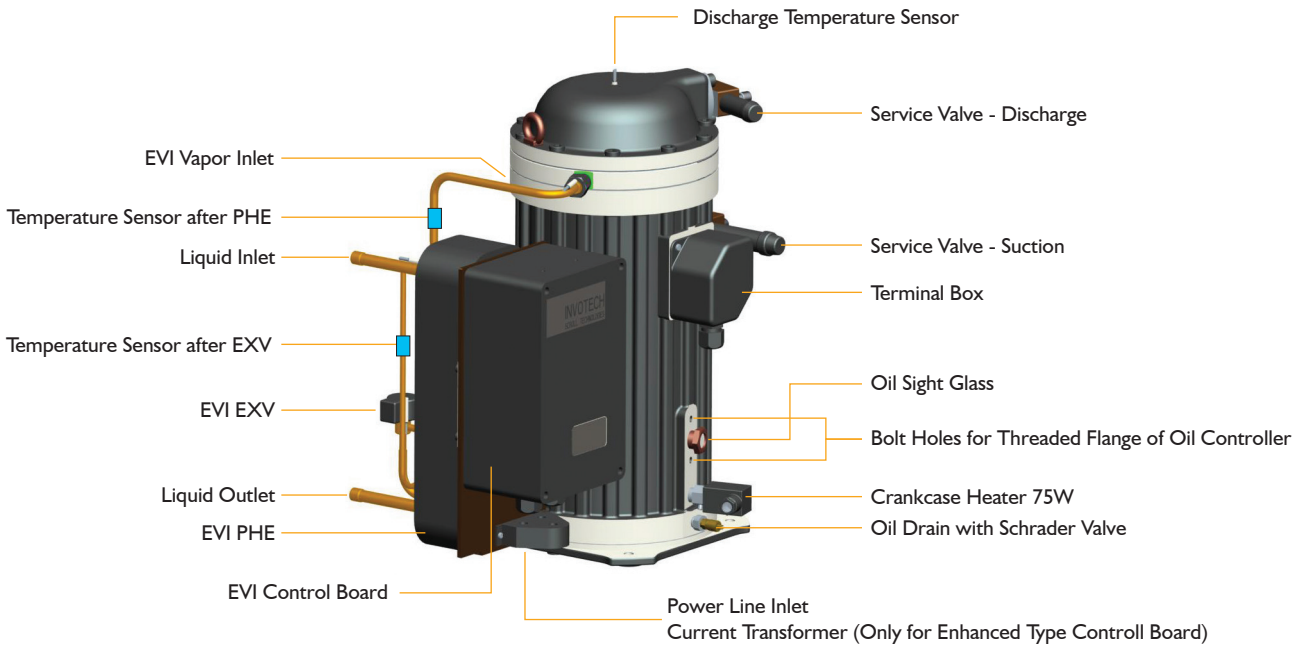
It is the outstanding engineering capability
that builds the incomparable reliability

YSF Series

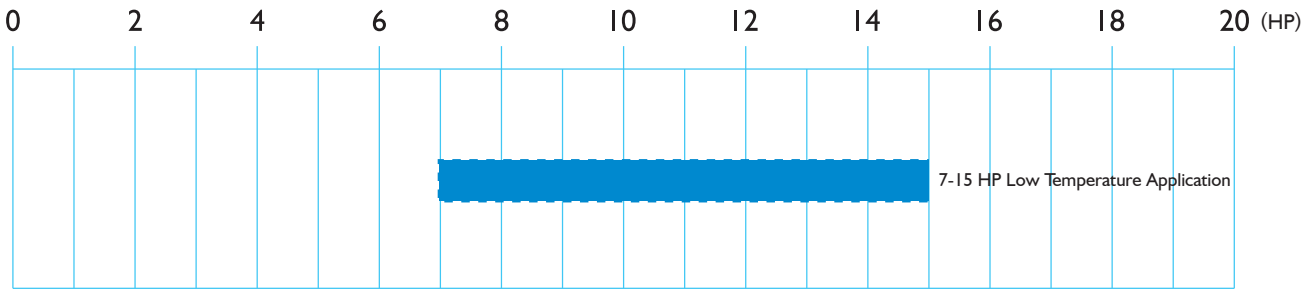
Semi-Hermetic Refrigeration Scroll Compressor

- Specific Design for Refs. Application, Not Only the Scroll Set But Also the Unit, Precise Product-Definition Based on Customer's Need
- Both Build-in Radius and Axial Compliances Design, Improved Floating Seal Design for Better Energy Efficiency
- Excellent Discharge Temperature Management to Stretch Operation Envelope
- Accurate Calculation of Load and Sealing Force for Running Sound Optimization
- High Efficiency Motor Design
- Integrated Vapor Injection and Controller
- Evaporating Temperature can be Lower to -40°C

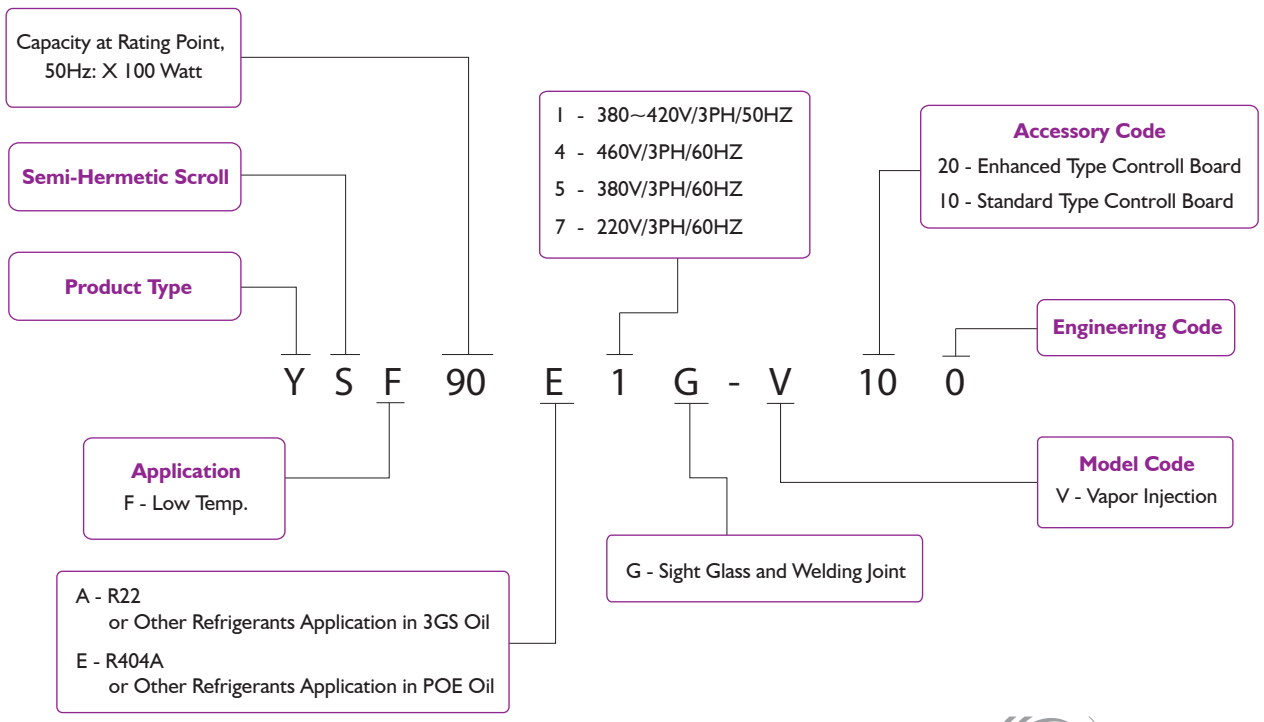


YSF Series

Models



Nomenclature



YSF Series

Specifications

R22

Model	YSF60A1G -V100	YSF65A1G -V100	YSF75A1G -V100	YSF85A1G -V100	YSF90A1G -V100	YSF100A1G -V100	YSF125A1G -V100
Electricity	380V/50Hz/3P						
Displacement (CC/Rev)	115.5	123.0	145.4	167.2	189.1	197.1	243.9
Refrigerant	R22						
Capacity (W)	6000	6400	7400	8480	9500	10000	12500
Power in Watt (W)	4170	4450	5070	5800	6420	6760	8445
COP (W/W)	1.44	1.44	1.46	1.46	1.48	1.48	1.48
Running Current (A)	9.2	9.6	10.4	11.2	12.1	12.6	16.0
LRA (A)	117	117	117	117	117	117	148.5
MOC (A)	17.6	19.0	22.0	25.0	28.0	24.7	30.4
Crankcase Heater (W)	75						
Fitting Dimensions (Inch)							
Discharge Tube (OD)	7/8						
Suction Tube (OD)	1 1/8						
Product Dimensions(MM)							
Length (L)	488						
Width (W)	360						381
Height (H)	562						569
Feet Dimensions (Hole)	190 X 190(8.5)						
Oil Type	3GS						
Initial Charge Volume(L)	2.7						
Recharge Volume(L)	2.6						
Max Operating Pressure(MPa)							
High Side	3.0						
Low Side	2.0						
Weight(kg)	90	90	91	91	91	91	93

E.T. -31.6°C, C.T. 40.6°C, R.G. 4.4°C, No Subcooling

YSF Series

Specifications

R404A

Model	YSF60E1G -V100	YSF65E1G -V100	YSF75E1G -V100	YSF85E1G -V100	YSF90E1G -V100	YSF100E1G -V100	YSF125E1G -V100
Electricity	380V/50Hz/3P						
Displacement (CC/Rev)	115.5	123.0	145.4	167.2	189.1	197.1	243.9
Refrigerant	R404A						
Capacity (W)	6910	7360	8704	10010	11320	11800	14600
Power in Watt (W)	4369	4660	5440	6256	6988	7284	9125
COP (W/W)	1.58	1.58	1.60	1.60	1.62	1.62	1.60
Running Current (A)	9.5	10.0	10.8	11.9	12.9	13.3	17.1
LRA (A)	117	117	117	117	117	117	148.5
MOC (A)	17.9	19.1	22.3	25.7	28.8	27.0	33.4
Crankcase Heater (W)	75						
Fitting Dimensions (Inch)							
Discharge Tube (OD)	7/8						
Suction Tube (OD)	1 1/8						
Product Dimensions(MM)							
Length (L)	488						
Width (W)	360						381
Height (H)	562						569
Feet Dimensions (Hole)	190 X 190(8.5)						
Oil Type	POE						
Initial Charge Volume(L)	2.7						
Recharge Volume(L)	2.6						
Max Operating Pressure(MPa)							
High Side	3.0						
Low Side	2.0						
Weight(kg)	90	90	91	91	91	91	93

E.T. -31.6°C, C.T. 40.6°C, R.G. 4.4°C, No Subcooling

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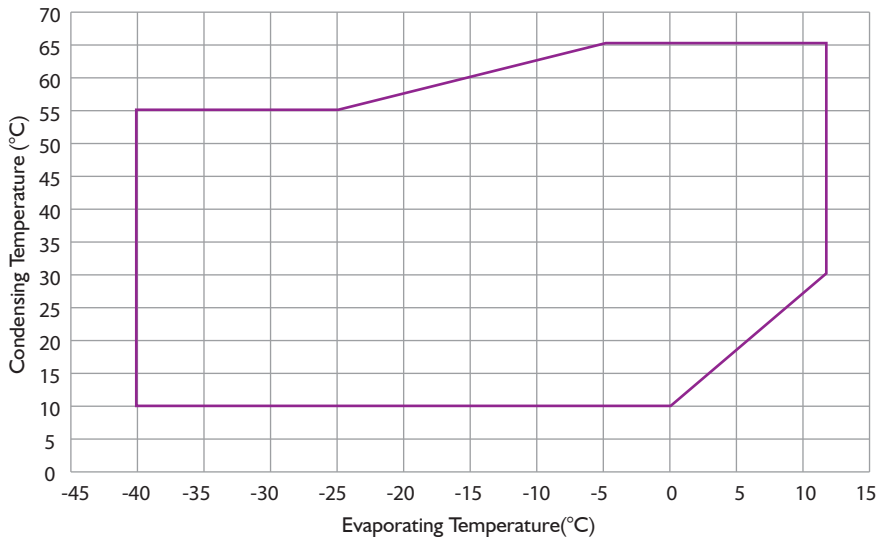
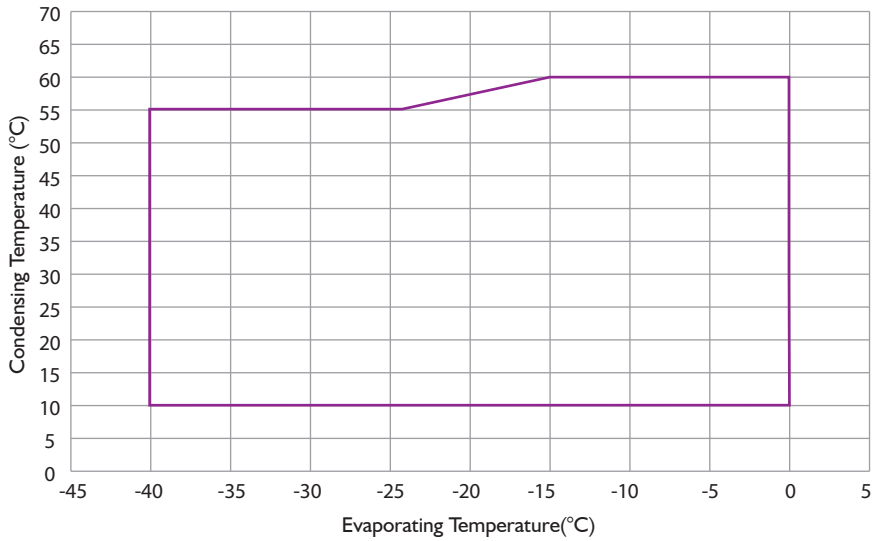
Operating Envelope

YSF60-YSF90



20°C Return Gas Temperature, No Sub Cooling

YSF100/YSF125

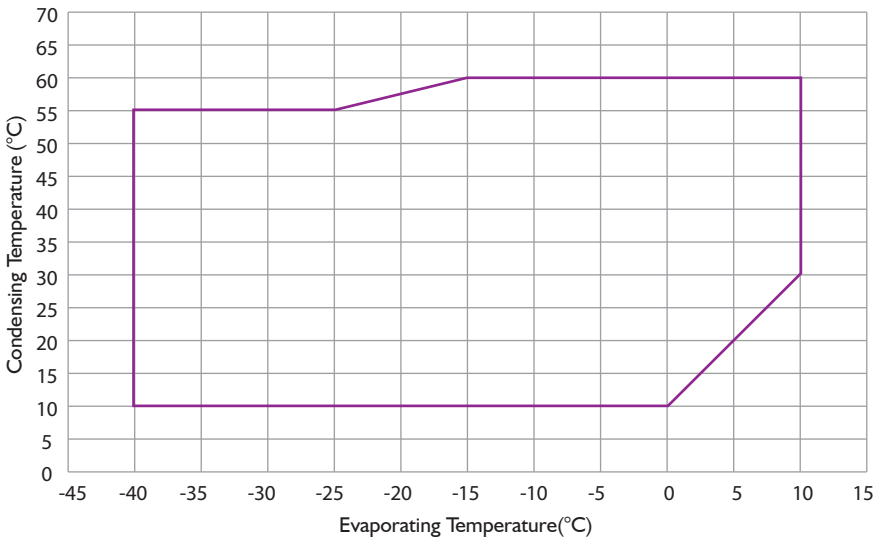


20°C Return Gas Temperature, No Sub Cooling

Operating Envelope

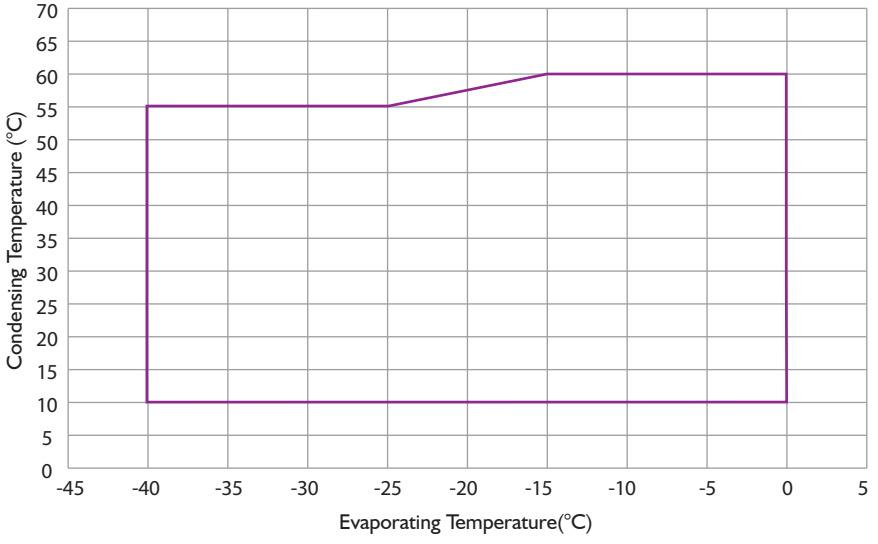
R404A

YSF60-YSF90



20°C Return Gas Temperature, No Sub Cooling

YSF100/YSF125



20°C Return Gas Temperature, No Sub Cooling

YSF Series

Capacity

R22

Model		C.T. (°C)	E.T.(°C)										
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
YSF60A1G-V100	Capacity (W)	65								12864	15127	17390	19652
		60						9340	11108	13121	15398	17674	19950
		55	3518	4380	5397	6585	7961	9541	11342	13379	15668	17958	20248
		50	3607	4545	5629	6875	8299	9916	11744	13799	16096	18394	20691
		45	3822	4832	5977	7275	8740	10389	12239	14305	16604	18904	21203
		40	4087	5163	6364	7707	9208	10883	12749	14821	17117	19412	21708
		35	4326	5462	6713	8096	9627	11322	13198	15271	17556	19842	22128
		30	4462	5652	6947	8364	9920	11629	13510	15577	17848	20118	22389
		25	4420	5657	6991	8437	10010	11729	13608	15664	17913	20163	22412
	Watt (W)	65								8095	8528	8961	9395
		60						6879	7143	7460	7866	8271	8676
		55	5033	5444	5744	5970	6156	6338	6549	6826	7203	7580	7957
		50	4705	5024	5245	5404	5536	5675	5856	6115	6486	6856	7227
		45	4235	4485	4650	4764	4863	4982	5155	5418	5805	6192	6579
		40	3716	3919	4049	4142	4230	4351	4538	4827	5253	5678	6103
		35	3239	3418	3536	3628	3729	3873	4097	4434	4920	5406	5892
		30	2896	3073	3201	3315	3450	3641	3923	4331	4900	5469	6038
		25	2780	2976	3136	3294	3486	3746	4109	4610	5284	5958	6632
YSF65A1G-V100	Capacity (W)	65								13696	16105	18514	20924
		60						9945	11826	13970	16393	18817	21241
		55	3745	4663	5746	7011	8476	10158	12075	14244	16682	19120	21558
		50	3840	4839	5994	7320	8835	10558	12504	14691	17137	19583	22029
		45	4069	5144	6364	7745	9305	11061	13030	15230	17678	20126	22574
		40	4351	5497	6776	8205	9803	11587	13573	15780	18224	20668	23112
		35	4606	5815	7147	8619	10249	12054	14051	16258	18692	21126	23559
		30	4751	6017	7396	8905	10561	12381	14383	16584	19002	21419	23837
		25	4705	6023	7443	8982	10658	12487	14488	16677	19072	21467	23862
	Watt (W)	65								8618	9079	9541	10002
		60						7324	7605	7943	8374	8806	9237
		55	5359	5796	6116	6356	6555	6748	6973	7268	7669	8070	8471
		50	5009	5349	5585	5754	5894	6042	6235	6510	6905	7300	7695
		45	4509	4775	4951	5072	5178	5304	5489	5768	6180	6592	7004
		40	3956	4173	4311	4409	4504	4632	4832	5139	5592	6045	6498
		35	3449	3639	3765	3862	3970	4124	4362	4721	5239	5756	6274
		30	3084	3272	3408	3529	3673	3877	4177	4611	5217	5823	6429
		25	2959	3169	3339	3507	3711	3988	4374	4908	5625	6343	7061
YSF75A1G-V100	Capacity (W)	65								16192	19040	21888	24737
		60						11757	13981	16516	19381	22246	25111
		55	4428	5513	6793	8288	10021	12010	14276	16840	19722	22604	25486
		50	4540	5721	7086	8654	10445	12482	14782	17368	20260	23152	26044
		45	4810	6082	7524	9157	11001	13077	15405	18006	20900	23794	26688
		40	5144	6498	8010	9701	11590	13698	16047	18655	21545	24434	27324
		35	5445	6875	8449	10190	12117	14251	16612	19221	22098	24976	27853
		30	5617	7114	8744	10528	12486	14638	17005	19607	22465	25323	28181
		25	5563	7121	8800	10619	12600	14763	17128	19716	22548	25379	28211
	Watt (W)	65								10088	10628	11168	11708
		60						8573	8902	9297	9802	10307	10812
		55	6273	6784	7159	7440	7672	7898	8162	8507	8977	9446	9916
		50	5863	6261	6537	6735	6899	7072	7298	7621	8083	8545	9007
		45	5278	5589	5795	5938	6061	6209	6425	6752	7234	7717	8199
		40	4631	4884	5047	5161	5272	5422	5656	6016	6546	7076	7606
		35	4037	4260	4407	4521	4647	4827	5106	5526	6132	6738	7343
		30	3610	3830	3989	4131	4299	4538	4889	5398	6107	6816	7525
		25	3464	3709	3908	4106	4344	4668	5120	5745	6585	7425	8265

Capacity @ 20°C Return Gas Temperature, No Sub Cooling

YSF Series

Capacity

R22

Model		C.T. (°C)	E.T.(°C)										
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
YSF85AIG-V100	Capacity (W)	65								18624	21900	25176	28452
		60						13523	16081	18996	22292	25588	28883
		55	5093	6341	7813	9533	11526	13813	16420	19369	22684	25999	29314
		50	5221	6581	8150	9954	12014	14356	17003	19977	23303	26630	29956
		45	5533	6995	8654	10532	12653	15041	17718	20710	24039	27368	30697
		40	5917	7474	9213	11158	13331	15756	18457	21457	24781	28104	31427
		35	6263	7907	9718	11720	13937	16391	19107	22108	25418	28727	32037
		30	6460	8183	10058	12109	14361	16836	19559	22552	25839	29126	32413
		25	6398	8191	10121	12214	14493	16981	19701	22678	25934	29191	32448
	Watt (W)	65								11603	12224	12845	13467
		60						9860	10239	10694	11275	11855	12436
		55	7215	7803	8234	8558	8825	9085	9388	9785	10325	10865	11405
		50	6744	7201	7519	7747	7935	8135	8394	8765	9297	9828	10360
		45	6071	6429	6665	6829	6971	7141	7390	7766	8321	8876	9430
		40	5326	5618	5805	5937	6064	6237	6505	6919	7529	8139	8749
		35	4643	4899	5068	5200	5345	5552	5873	6356	7053	7750	8446
		30	4152	4405	4588	4752	4945	5219	5624	6209	7024	7840	8655
		25	3984	4266	4495	4722	4997	5369	5889	6608	7574	8540	9506
YSF90AIG-V100	Capacity (W)	65								21056	24760	28463	32167
		60						15289	18181	21477	25203	28929	32655
		55	5758	7169	8833	10778	13031	15617	18564	21898	25646	29394	33142
		50	5903	7440	9214	11253	13583	16231	19223	22586	26346	30107	33867
		45	6255	7909	9784	11907	14305	17005	20032	23415	27178	30942	34706
		40	6690	8450	10417	12615	15071	17813	20867	24259	28017	31774	35531
		35	7081	8940	10987	13251	15757	18532	21602	24995	28737	32478	36220
		30	7304	9251	11371	13691	16237	19035	22113	25497	29213	32930	36646
		25	7234	9260	11443	13809	16385	19198	22274	25639	29321	33003	36685
	Watt (W)	65								12988	13684	14379	15074
		60						11038	11462	11971	12621	13271	13921
		55	8076	8735	9217	9579	9878	10169	10509	10953	11558	12163	12767
		50	7549	8061	8417	8672	8883	9106	9397	9812	10407	11002	11597
		45	6795	7197	7461	7645	7804	7994	8272	8693	9314	9935	10556
		40	5962	6289	6498	6645	6788	6981	7282	7745	8428	9111	9793
		35	5197	5484	5674	5821	5983	6215	6574	7115	7895	8675	9455
		30	4647	4931	5136	5319	5536	5842	6295	6950	7863	8776	9688
		25	4460	4775	5032	5286	5593	6010	6593	7396	8478	9559	10641
YSF100AIG-V100	Capacity (W)	65											
		60						15939	18955	22391	26275		
		55	6003	7474	9209	11237	13585	16282	19354	22830	26738		
		50	6154	7756	9606	11732	14161	16922	20041	23547	27468		
		45	6522	8245	10200	12414	14914	17728	20885	24411	28335		
		40	6974	8810	10860	13151	15713	18571	21755	25292	29209		
		35	7382	9320	11455	13815	16427	19320	22522	26059	29960		
		30	7615	9645	11855	14273	16927	19845	23054	26582	30456		
		25	7542	9654	11930	14397	17083	20015	23221	26730	30569		
	Watt (W)	65											
		60						11507	11949	12480	13158		
		55	8420	9106	9609	9987	10299	10602	10956	11419	12050		
		50	7870	8404	8775	9041	9261	9493	9797	10229	10849		
		45	7084	7503	7779	7970	8136	8334	8624	9063	9711		
		40	6216	6556	6774	6928	7077	7279	7592	8075	8787		
		35	5418	5718	5915	6069	6237	6480	6854	7418	8231		
		30	4845	5141	5354	5545	5771	6091	6563	7245	8197		
		25	4650	4979	5246	5511	5831	6266	6873	7711	8839		

Capacity @ 20°C Return Gas Temperature, No Sub Cooling

YSF Series

Capacity

R22

Model		C.T. (°C)	E.T.(°C)										
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
YSF125AIG-V100	Capacity (W)	65											
		60						19709	23438	27687	32490		
		55	7423	9241	11387	13895	16799	20133	23932	28230	33062		
		50	7610	9591	11879	14507	17511	20924	24781	29117	33964		
		45	8064	10196	12613	15350	18441	21921	25825	30185	35037		
		40	8624	10894	13428	16262	19429	22964	26901	31274	36118		
		35	9128	11524	14164	17082	20313	23890	27848	32222	37046		
		30	9416	11926	14659	17649	20931	24539	28507	32869	37660		
		25	9704	11938	14752	17802	21123	24749	28714	33053	37799		
	Watt (W)	65											
		60						14229	14776	15432	16270		
		55	10412	11260	11882	12349	12735	13110	13548	14120	14900		
		50	9732	10392	10850	11179	11451	11739	12114	12649	13416		
		45	8760	9277	9618	9855	10060	10306	10664	11207	12007		
		40	7686	8107	8376	8567	8751	9000	9387	9985	10865		
		35	6700	7070	7314	7504	7713	8012	8475	9172	10178		
		30	5991	6357	6621	6857	7136	7532	8115	8959	10136		
		25	5749	6156	6487	6815	6933	7051	7756	8746	10094		

Capacity @ 20°C Return Gas Temperature, No Sub Cooling

YSF Series

Capacity

R404A

Model		C.T. (°C)	E.T.(°C)										
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
YSF60E1G-V100	Capacity (W)	60						9170	10722	12473	14453	16434	18415
		55	3684	4772	5914	7144	8494	9997	11684	13588	15742	17896	20050
		50	4084	5211	6411	7719	9165	10783	12604	14663	16990	19317	21644
		45	4448	5613	6872	8256	9799	11532	13488	15699	18199	20699	23198
		40	4779	5983	7299	8760	10398	12246	14336	16701	19373	22045	24717
		35	5080	6321	7695	9232	10966	12928	15152	17670	20514	23358	26202
		30	5353	6632	8062	9676	11505	13581	15939	18609	21625	24640	27656
		25	5601	6918	8405	10094	12017	14208	16699	19521	22708	25895	29082
	Watt (W)	60						7378	7726	8135	8609	9083	9556
		55	5898	5973	6088	6244	6446	6695	6996	7350	7761	8172	8583
		50	5295	5367	5470	5608	5783	5999	6258	6564	6919	7274	7629
		45	4687	4762	4861	4987	5143	5332	5557	5822	6128	6434	6740
		40	4118	4203	4304	4425	4569	4738	4936	5166	5430	5694	5958
		35	3631	3732	3843	3966	4105	4261	4439	4641	4869	5098	5327
		30	3269	3395	3522	3654	3794	3944	4109	4290	4490	4691	4891
		25	3077	3233	3384	3532	3680	3832	3989	4156	4336	4515	4694
YSF65E1G-V100	Capacity (W)	60						9764	11416	13279	15388	17497	19606
		55	3922	5080	6297	7606	9044	10643	12439	14467	16760	19053	21347
		50	4348	5548	6826	8218	9758	11480	13420	15611	18088	20566	23043
		45	4736	5976	7316	8790	10432	12277	14360	16715	19376	22037	24699
		40	5088	6370	7771	9326	11070	13038	15263	17781	20626	23471	26315
		35	5408	6730	8192	9829	11675	13764	16132	18813	21841	24869	27896
		30	5699	7061	8584	10302	12249	14460	16970	19813	23023	26234	29445
		25	5963	7365	8948	10746	12794	15127	17779	20784	24177	27570	30963
	Watt (W)	60						7855	8226	8662	9166	9670	10175
		55	6280	6360	6482	6648	6863	7128	7448	7825	8263	8700	9138
		50	5638	5714	5824	5971	6157	6387	6663	6989	7367	7745	8122
		45	4991	5070	5175	5309	5476	5677	5917	6198	6524	6850	7175
		40	4384	4474	4582	4711	4864	5045	5256	5500	5781	6062	6343
		35	3866	3974	4092	4223	4370	4537	4726	4941	5184	5428	5672
		30	3481	3614	3750	3890	4039	4200	4374	4567	4781	4994	5208
		25	3276	3442	3602	3760	3918	4079	4247	4425	4616	4807	4997
YSF75E1G-V100	Capacity (W)	60						11543	13496	15699	18193	20686	23179
		55	4637	6006	7444	8993	10692	12583	14706	17103	19815	22526	25237
		50	5140	6559	8070	9715	11536	13572	15865	18456	21385	24314	27243
		45	5599	7066	8650	10392	12334	14515	16977	19761	22907	26054	29200
		40	6015	7530	9187	11026	13088	15414	18045	21022	24385	27748	31111
		35	6394	7957	9685	11620	13803	16273	19072	22241	25821	29401	32980
		30	6738	8348	10148	12179	14481	17095	20062	23423	27219	31015	34811
		25	7050	8708	10579	12705	15126	17884	21019	24571	28583	32595	36606
	Watt (W)	60						9194	9628	10139	10729	11319	11910
		55	7351	7444	7587	7782	8033	8344	8718	9160	9672	10184	10696
		50	6599	6688	6817	6989	7207	7476	7800	8180	8623	9065	9508
		45	5842	5935	6058	6215	6409	6645	6926	7255	7636	8018	8399
		40	5132	5238	5364	5515	5694	5905	6152	6438	6767	7096	7425
		35	4525	4651	4789	4943	5115	5311	5532	5783	6069	6354	6639
		30	4074	4230	4389	4554	4728	4916	5121	5346	5596	5846	6096
		25	3835	4029	4217	4401	4586	4775	4972	5180	5403	5626	5850

Capacity @ 20°C Return Gas Temperature, No Sub Cooling

YSF Series

Capacity

R404A

Model		C.T. (°C)	E.T.(°C)										
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
YSF85E1G-V100	Capacity (W)	60						13277	15524	18057	20925	23793	26660
		55	5334	6908	8563	10343	12298	14473	16915	19672	22791	25909	29028
		50	5913	7544	9282	11175	13269	15611	18248	21228	24597	27966	31335
		45	6440	8127	9949	11953	14186	16695	19527	22729	26348	29967	33586
		40	6919	8662	10567	12682	15054	17729	20755	24179	28047	31916	35784
		35	7354	9152	11140	13366	15876	18717	21937	25582	29699	33817	37934
		30	7750	9602	11672	14008	16656	19663	23076	26941	31307	35673	40039
		25	8109	10015	12168	14613	17398	20570	24176	28262	32876	37490	42104
	Watt (W)	60						10575	11074	11661	12340	13019	13699
		55	8455	8563	8727	8951	9240	9597	10028	10536	11125	11714	12303
		50	7591	7693	7841	8038	8290	8599	8971	9409	9918	10427	10936
		45	6719	6826	6968	7148	7372	7643	7966	8345	8783	9222	9661
		40	5903	6024	6169	6343	6549	6792	7076	7405	7783	8162	8540
		35	5204	5350	5509	5685	5884	6108	6363	6652	6980	7308	7636
		30	4686	4866	5048	5238	5438	5654	5890	6149	6436	6724	7011
		25	4411	4634	4850	5062	5275	5492	5718	5958	6215	6472	6728
YSF90E1G-V100	Capacity (W)	60						15010	17551	20415	23658	26900	30142
		55	6030	7810	9681	11694	13904	16363	19124	22241	25767	29292	32818
		50	6685	8529	10494	12634	15001	17649	20631	24000	27809	31618	35427
		45	7281	9188	11248	13514	16038	18875	22077	25697	29788	33880	37971
		40	7822	9793	11947	14338	17019	20044	23465	27336	31710	36083	40457
		35	8315	10347	12595	15111	17949	21161	24801	28922	33577	38233	42888
		30	8762	10856	13197	15837	18831	22230	26089	30460	35396	40332	45268
		25	9168	11323	13757	16521	19670	23256	27332	31952	37169	42386	47602
	Watt (W)	60						11838	12397	13054	13814	14574	15334
		55	9464	9585	9768	10020	10343	10743	11225	11793	12453	13112	13771
		50	8497	8611	8777	8998	9280	9626	10042	10533	11102	11672	12241
		45	7521	7641	7800	8002	8252	8556	8917	9341	9832	10323	10814
		40	6608	6743	6906	7100	7331	7603	7921	8289	8712	9136	9559
		35	5826	5989	6167	6364	6586	6837	7123	7446	7813	8180	8547
		30	5246	5447	5651	5863	6087	6329	6593	6883	7205	7527	7848
		25	4937	5188	5429	5667	5905	6148	6401	6669	6957	7244	7532
YSF100E1G-V100	Capacity (W)	60						15649	18298	21284	24664		
		55	6287	8143	10093	12192	14495	17059	19938	23187	26863		
		50	6969	8892	10941	13172	15640	18400	21509	25021	28992		
		45	7590	9579	11727	14089	16721	19678	23016	26790	31056		
		40	8155	10209	12455	14948	17744	20897	24464	28500	33059		
		35	8668	10787	13131	15754	18713	22062	25857	30153	35006		
		30	9134	11318	13758	16511	19632	23176	27199	31756	36902		
		25	9558	11805	14342	17224	20507	24246	28496	33312	38751		
	Watt (W)	60						12342	12924	13609	14402		
		55	9867	9993	10184	10446	10783	11200	11703	12295	12983		
		50	8858	8978	9151	9381	9674	10036	10469	10981	11575		
		45	7841	7966	8131	8342	8603	8920	9297	9739	10250		
		40	6889	7030	7200	7403	7643	7927	8258	8642	9083		
		35	6074	6243	6429	6635	6866	7128	7426	7763	8146		
		30	5469	5679	5891	6112	6346	6598	6873	7176	7511		
		25	5148	5408	5660	5908	6156	6410	6674	6953	7253		

Capacity @ 20°C Return Gas Temperature, No Sub Cooling

YSF Series

Capacity

R404A

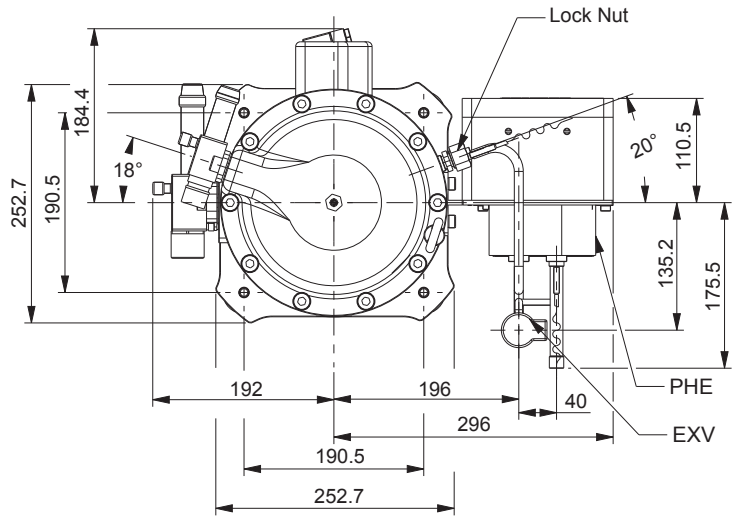
Model		C.T. (°C)	E.T.(°C)									
			-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
YSF125E1G-V100	Capacity (W)	60						19367	22645	26342	30525		
		55	7781	10078	12491	15088	17939	21112	24675	28697	33246		
		50	8625	11004	13540	16301	19356	22773	26620	30967	35881		
		45	9394	11855	14513	17436	20694	24354	28485	33156	38435		
		40	10093	12635	15415	18500	21960	25863	30277	35271	40914		
		35	10728	13351	16251	19497	23159	27304	32000	37318	43324		
		30	11305	14007	17027	20435	24297	28683	33662	39301	45670		
		25	11829	14610	17750	21317	25380	30007	35266	41227	47958		
	Watt (W)	60						15274	15995	16843	17824		
		55	12211	12367	12604	12928	13345	13862	14483	15217	16067		
		50	10963	11111	11325	11610	11973	12420	12957	13590	14325		
		45	9705	9859	10064	10324	10648	11039	11506	12053	12686		
		40	8526	8701	8911	9161	9459	9810	10220	10695	11241		
		35	7517	7727	7956	8211	8498	8822	9190	9608	10081		
		30	6768	7028	7291	7565	7854	8166	8506	8881	9296		
		25	6371	6694	7005	7312	7619	7932	8259	8605	8976		

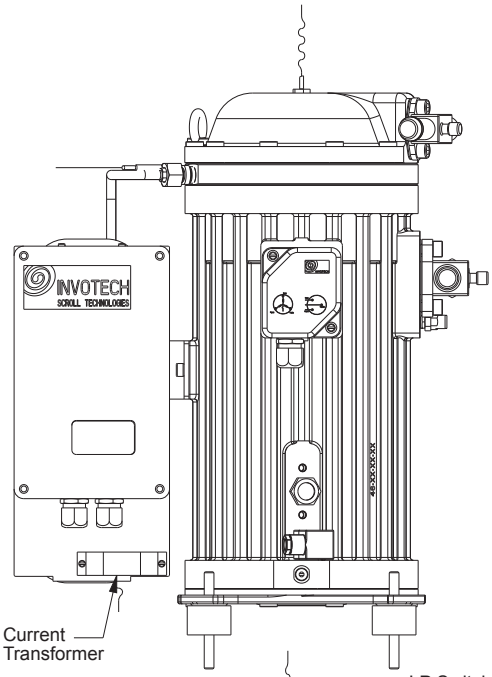
Capacity @ 20°C Return Gas Temperature, No Sub Cooling

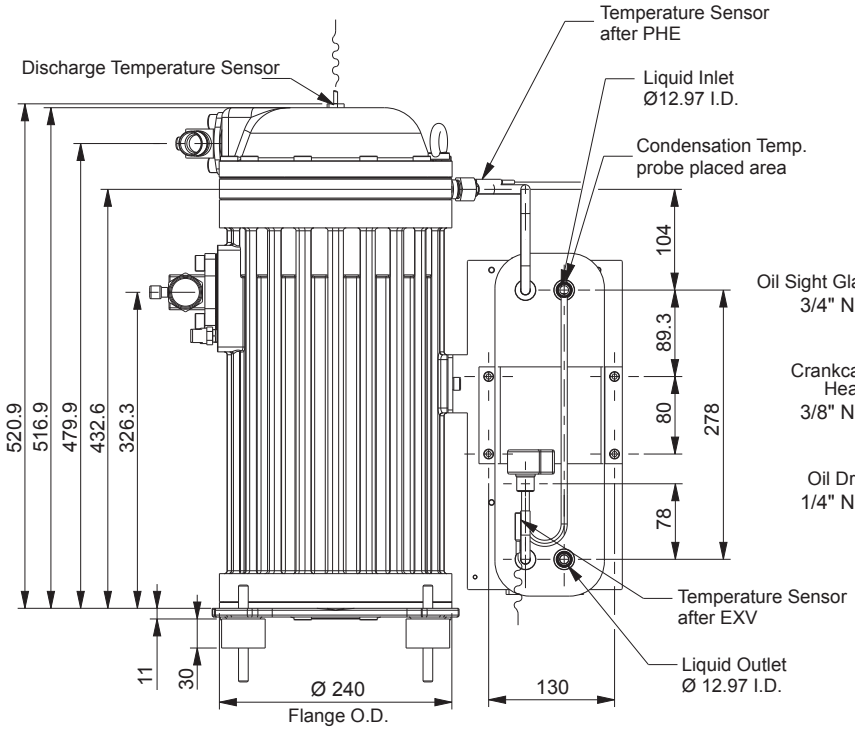
YSF Series

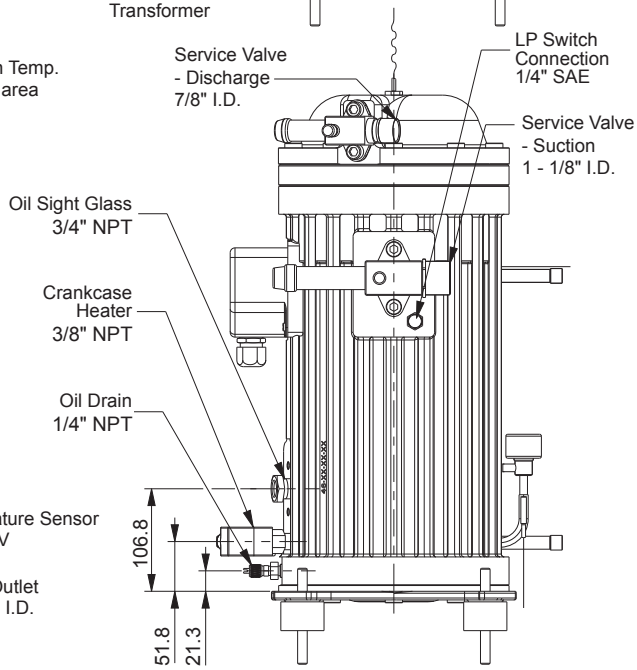
Dimensions

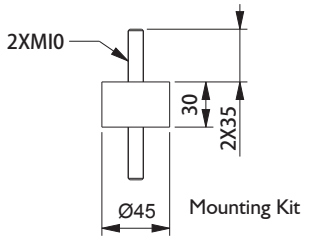
YSF 60-100

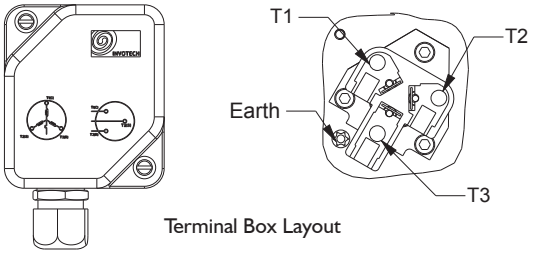






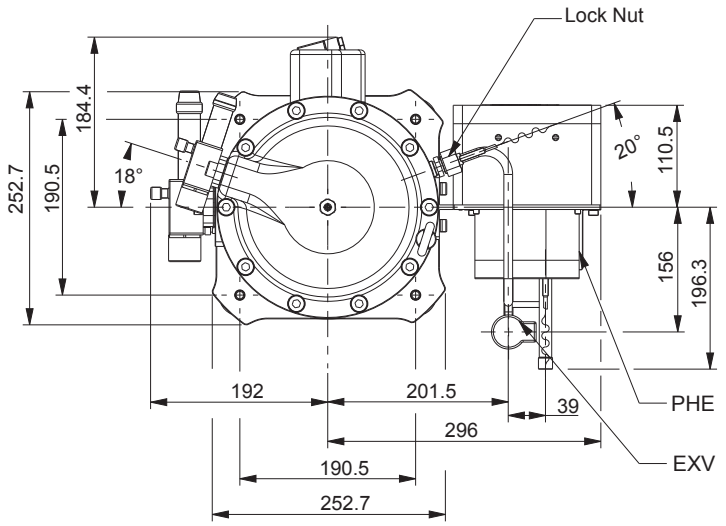


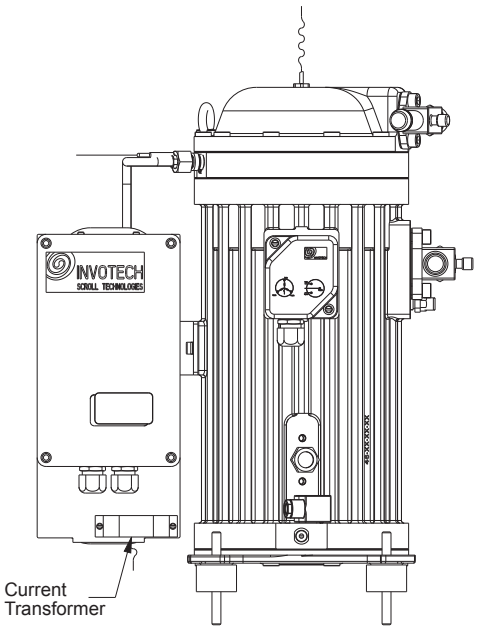


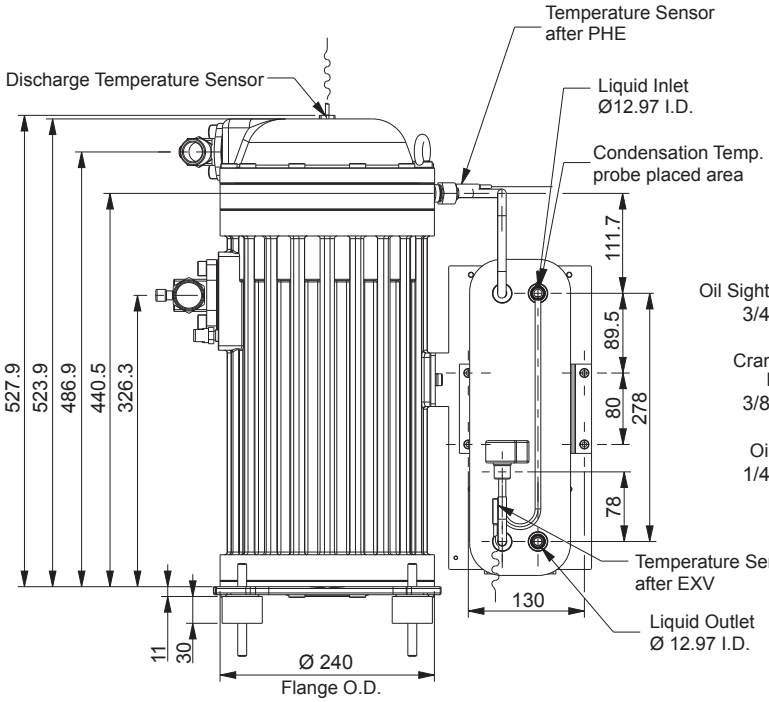


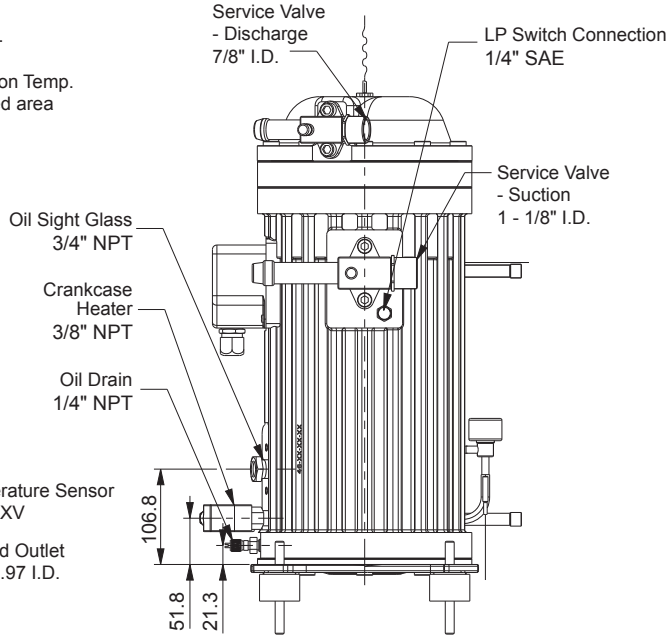
Dimensions

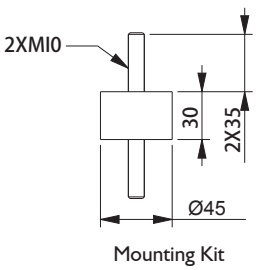
YSF125



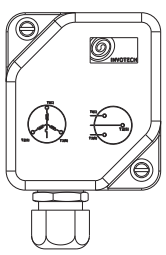


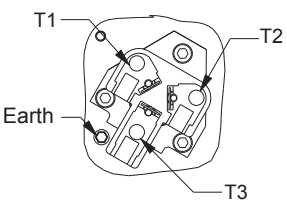






Mounting Kit





Terminal Box Layout

YSF Series

Application Instruction

Main Features of YSF Series:

- Classic vertical design
- Maintainability
  - Semi-hermetic design, all the parts can be removed and replaced
- Higher reliability
  - Dual compliances design
  - Strong capability to tolerate liquid flood back and impurities
- Less vibration and noise
- Wide operating range
  - Integrated EVI technologies
  - The evaporating temperature can be lower to -40°C
- Higher energy efficiency
  - High compression ratio is specially designed for refrigeration
  - Efficient economizer cycle
- More intelligent design
  - Control of EVI
  - Controller of refrigeration system (enhanced type control board)
  - Combination of fan speed regulation, start-stop and diagnosis (enhanced type control board)

1. Safety Instructions:

YSF serials Semi-hermetic scroll compressors are produced in strict accordance with international safety standards.

This section focuses on safe use of a user. Before carrying out any operation, this safety instruction should be carefully read. Please reserve it for reference at any time.

The compressor should be installed, tested and maintained by specialized technicians only; electrical connections must be operated by authorized and trained personnel.

Attention:

- Avoid collision and fall down during the transportation
- Lubricant must be correctly chosen and be the same as indicated on the compressor's nameplate
- Ensure that the power supply can satisfy the specific parameter as is shown on the compressor's nameplate
- Release the internal pressure before operating, the compressor is filled with dry nitrogen while leaving the factory

Prohibition:

- Extract vacuum using the scroll compressors
- Run the compressor which is in vacuum status
- Apply power to the compressor which doesn't connect to system
- Run the compressor without charging refrigerant
- Run the compressor outside of the published envelope
- Discharge refrigerant directly into environment without
- Hi-pot test in vacuum status

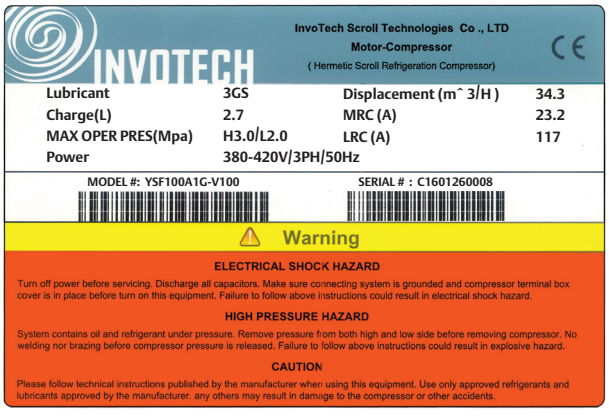
Warning:

- Strictly forbid the excess of pressure marked on the nameplate while running the compressor or checking the leakage of refrigerating system
- Strictly forbid running the compressor with air, for the mixture of air and oil may explore due to great heat contracted in the discharge port. It will cause damages to the compressor
- Completely open the suction and discharge valve before starting the compressor. It is very importance to open the discharge valve fully. If it is closed or partly closed, unacceptable high pressure and temperature will be produced inside the compressor
- Be sure to comply with relevant safety regulations

Avoid electric shock:

- Be sure to cut off power supply before operating
- The compressor can only be used after being connected to earth

2. Nameplate sample



3. Settings of pressure switches:

Attention: It is necessary to use a high pressure switch, the biggest cut out pressure should be below 28 bar(g). In order to protect the system as well as possible, the high pressure switch should possess the function of manual resetting whenever it is cut off. For all of the applications, the cut out set value of low pressure switch should not be lower than 0.1 bar(g). When setting the operating point of the low pressure switch, an accurate pressure gauge should be used because scales on the low pressure switch are for rough setting only. It is absolutely forbidden to run the compressor of YSF series in vacuum. Low pressure switch points must access to the connection port of low pressure switch on the compressor body.

4. Precaution of refrigerator oil

Don't mix up ester oil, mineral oil or alkyl benzene. The compressor has been filled with lubricant in advance before leaving the factory. Compressors with POE oil are available for R404A. The initial amount of oil is marked on the nameplate and the re-charge amount on the field site can be around 100 ml less than the initial one.

5. Installation

5.1 Shipment

Check packing lists which are attached to cases of each batch of goods carefully to make sure that both accessories and compressors are received. Invotech Company should be immediately informed of missing items in written form.

Standard configurations

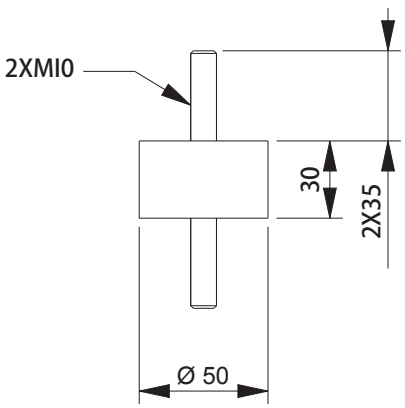
- Suction service valve and discharge service valve
- Economizer (PHE)
- Crankcase heater
- Refrigerating oil filling, oil level sight glass
- Electronic expansion valve
- Electronic control board
- Mounting kits

5.1.2 Packing

All the compressors of YSF series are individually packed. Accessories may be installed on the compressors or be placed inside the cases. Packages need keeping dry all the time.

5.1.3 Mounting Kits

Attention: In order to reduce vibration generated during starting and stopping cycle as much as possible, mounting kits should be used while installing the compressor. To maintain sufficient lubrication of moving parts, the compressor should be vertically installed.



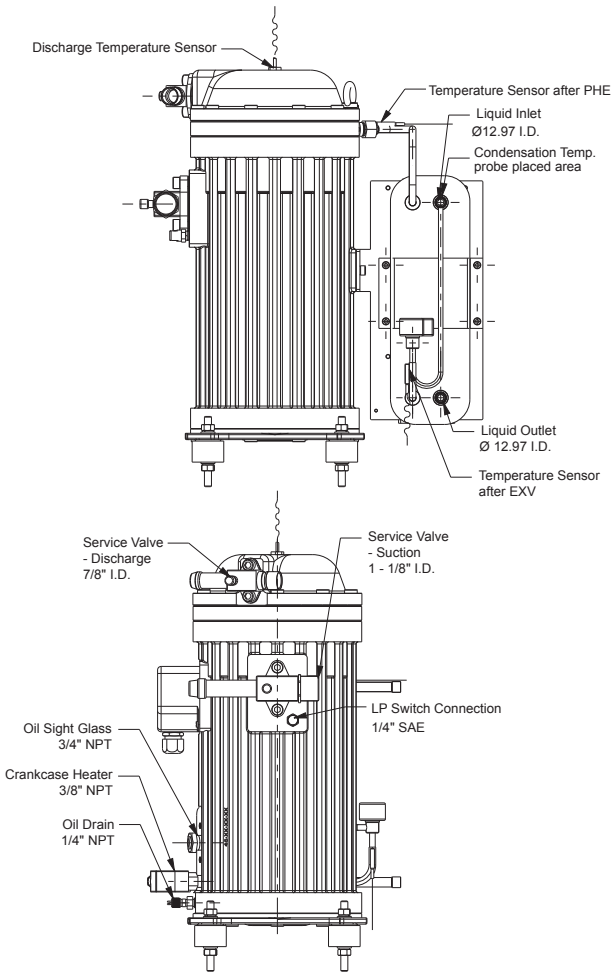
Mounting Kit

5.2 Pipe welding and compressor installation

5.2.1 Welding

- While welding all the joints, be sure to protect the system by charging nitrogen for it can remove oxygen to prevent oxide skin inside the pipe wall.
- Welding material which is recommended: any Cu-Ag alloy can be used, and it is best to contain 45% silver solder
- Wrap the suction and discharge service valves with wet cloth before welding

5.2.2 Connection of the compressor



The liquid inlet of main line: connect to outlet of condenser
The liquid outlet of main line: connect to entrance of expansion valve

In order to prevent impurities from invading into suction side of the compressors, Invotech specially installs the suction filter at the intake port of semi-hermetic scroll compressors of YSF series, so users must connect the low pressure switch to the connection port on the compressor body.

5.2.3 Pipe connection

Compressors of YSF series have significant features of low vibration, so the discharge pipe and the suction pipe do not need extra vibration absorber. The layout of suction pipe and discharge pipe should try to be close to the compressor as possible and parallel to the axis so that torsion generated from starting and stopping of the compressor can be absorbed.

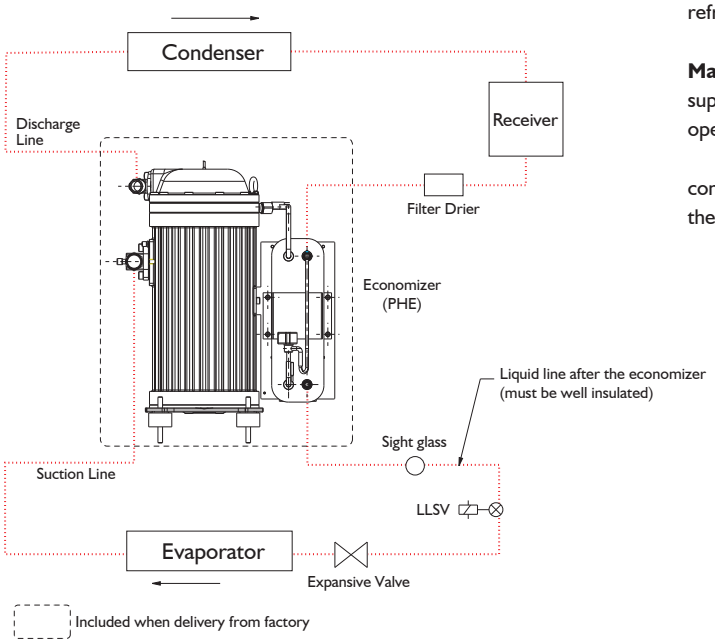
5.2.4 LLSV (Liquid Line Solenoid Valve)

LLSV contributes to separating liquid refrigerant to the low pressure side when the system is off. LLSV should be installed before the main expansion valve and try to approach it so that most of the liquid refrigerant can be reserved at the high pressure side. LLSV can prevent liquid migration on the off cycle. If the migration occurs during the off cycle, liquid is in the crankcase, when the compressor start next time, the explosion of the refrigerant out of the oil is a flood start. it is very dangerous to the compressor.

5.2.5 Insulation of liquid line

In the system of YSF series compressors, the liquid after the economizer is sub-cooled, and the sub-cooling of the liquid contribute to improve refrigerating capacity and efficiency of the system. No matter what makes the temperature of liquid rise, it will lead to the loss of capacity and efficiency of the system. So the liquid pipe after the economizer (PHE) must be well insulated and there is no need insulating the liquid pipe before the economizer.

6. Casual loop diagram of compressors of YSF series



7. Electrical connection

7.1 Three-phase motor

All the compressors of YSF series are three-phase, which can be directly start.

7.2 Control board

According to various requirements of clients, Invotech Company develops two kinds of control boards --- standard type and enhanced type. The compressor whose configuration number ends with "-V100" is equipped with a standard type control board. This type controls EVI only and the wiring is simple. It never overlaps functions of control box which are usually applied to projects. The compressor whose configuration number ends with "-V200" is equipped with enhanced type control board. It includes control functions of both condensing unit and even the refrigerating system.

Main technical index:

supply voltage:	AC220V±10%,50Hz
operating environment:	temperature -10°C~50°C, humidity≤85%, no condensation, no corrosion
contact outle capacity:	2A/250VAC (pure resistant load)
thermal sensor:	NTC R25=5kΩ, B(25/50)=3470K

7.2.1 Standard type control board

Such type of control board is a dedicated one for EVI scroll compressors. It is used to detect temperatures and control the operation of both the compressor and electronic expansion valve.

Main function:
Control of the compressor:
Start and stop the compressor according to switch signal
(passive switching mode contact, no power)

Crankcase heating tape:
It works when the compressor stops and it ceases heating once the compressor works.

Control of electronic expansion valve:
Both liquid injection and vapor injection modes are available

Warning of high discharge temperature:
Give an alarm when discharge temperature goes out of the upper limit and cancel the alarm when the temperature is down and less than the lower limit. If the alarm takes place more than three times in one hour, the compressor will be locked.

Warning of liquid flood back:
When the discharge temperature is lower than 45°C for and keep for more than 3 minutes, the control board will give an alarm of liquid flood back, but the compressor will keep running. When the discharge temperature is higher than 70°C, the alarm will stop.

Warning output:
When the alarm appears, the control board will output a passive switch signal to warn.

The first start-up mode:
When the compressor meets starting requirements, it should immediately run for 3 seconds and then stop for 17 seconds; repeat for 3 times and then start the normal operation. Required condition: **a.** Reapply power after switching off. **b.** Although continuously powered, the compressor has been off for more than one hour; **c.** After the defrost.

Process of start-up:
1. Apply power: check the signal of start/stop, if it is closed means under the start-up condition
2. Under the start-up condition, delay for 3 minutes, then entry the first start-up mode, and then to start the compressor

Process of shutting down:
Checking the signal of start- up and shutting down if it is open.

7.2.2 Enhanced type control board

Enhanced type of control board can control various functions of refrigerating units with EVI. It is used to detect temperatures, and controls operations of the compressor, electronic expansion valve, LLSV, condenser fan speed, crankcase heater, air cooler and defrosting. External alarm ports are available, and phase sequence and current sensing circuit is also available, to protect compressor effectively.

Main functions:
Control of the compressor:
start and stop the compressor, delay between two starts

Control of crankcase heater:
It is opposed to the start and stop logic of the compressor

Control of condenser fans:
According to the condensing temperature to adjust the condensing fan's running speed

Control of air cooler:
It synchronizes with the start and stop of the compressor

Control of defrosting:
There are two kinds of defrosting modes can be chosen: electric heating and hot-gas defrosting.

Control of electronic expansion valve:
Both liquid injection and vapor injection modes are available

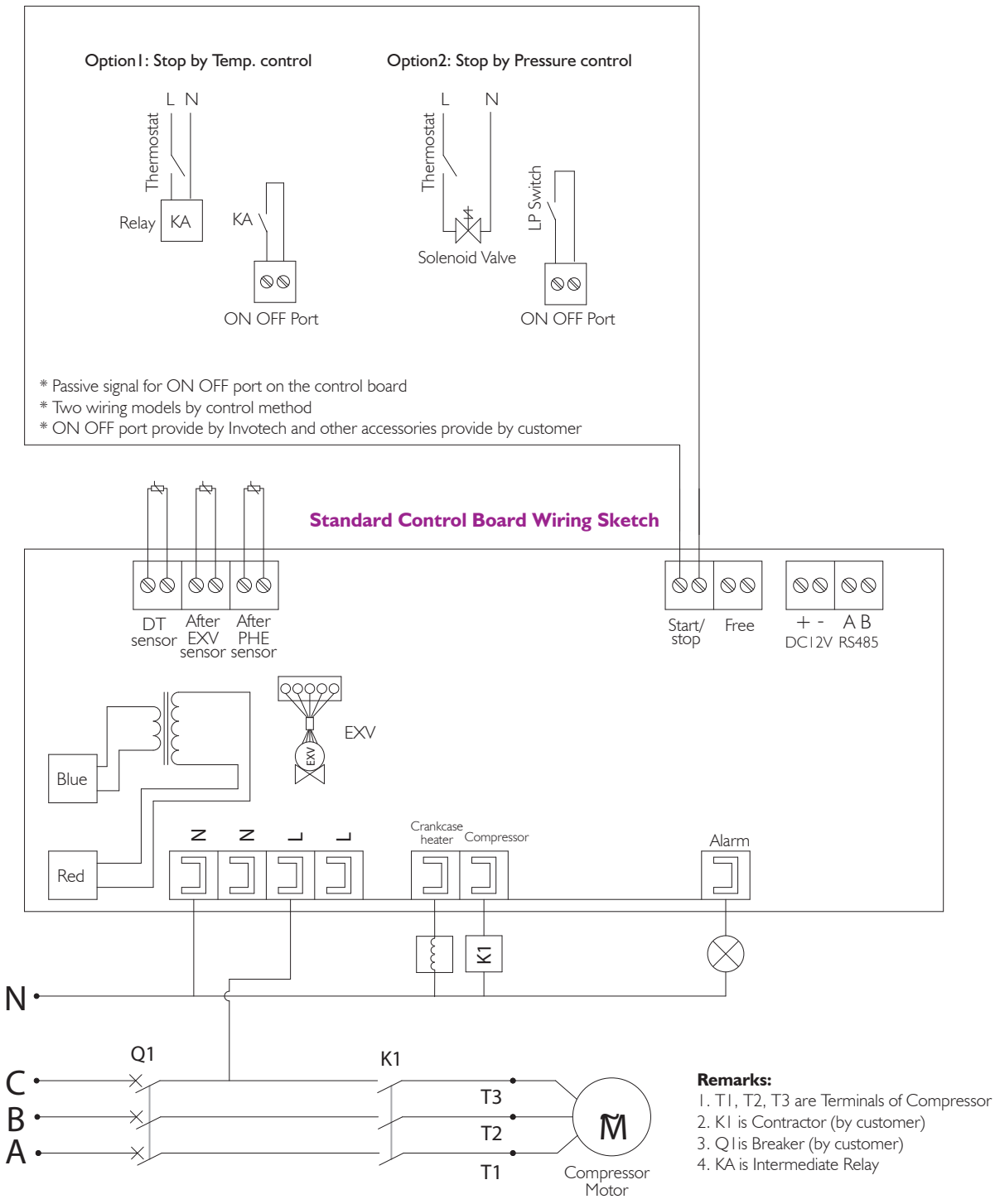
Warning of high discharge temperature:
Give an alarm when discharge temperature goes out of the upper limit and cancel the alarm when the temperature is down and lower than the lower limit. If the alarm takes place more than three times in one hour, the compressor will be locked.

Display and protection of compressors' current:
The compressor can display three-phase mean current and provide protective function of current overload and three-phase imbalance

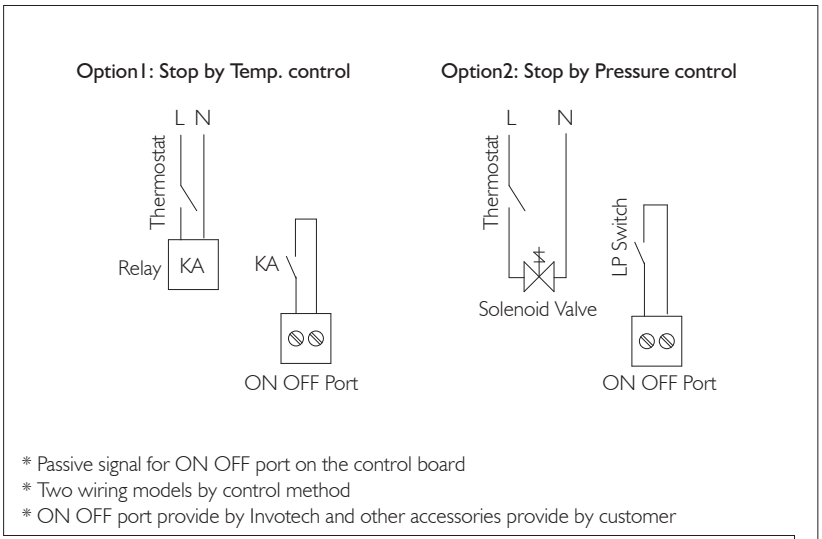
Control of external alarm:
Three external alarm ports are applied to protect high pressure, low pressure and oil level.

Protection of phase sequence:
When the sequence of three-phase current is wrong, the control board will stop the compressor.

Warning output:
When the alarm appears, the control board will output a passive switch signal to warn.

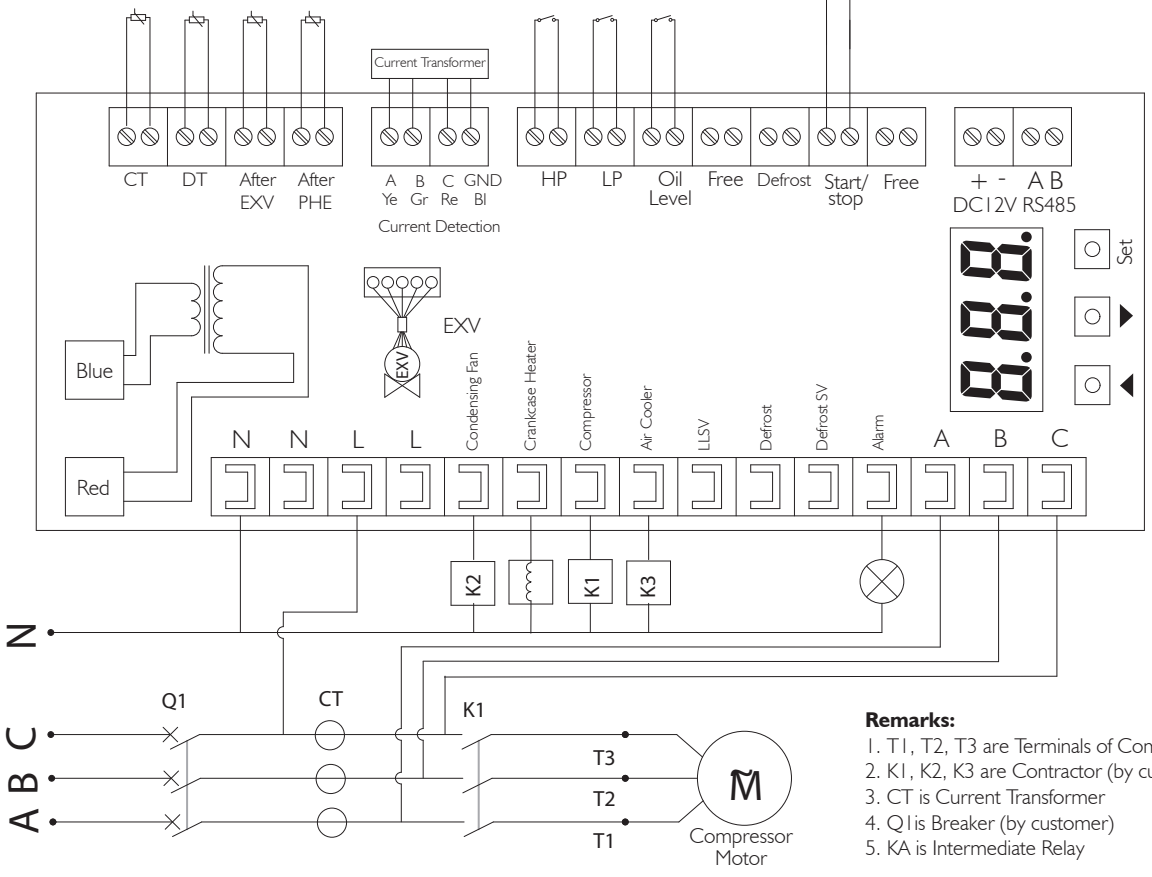


Remarks:
1. T1, T2, T3 are Terminals of Compressor
2. K1 is Contractor (by customer)
3. Q1is Breaker (by customer)
4. KA is Intermediate Relay



* Passive signal for ON OFF port on the control board
* Two wiring models by control method
* ON OFF port provide by Invotech and other accessories provide by customer

Enhanced type control board Wiring Sketch



Remarks:
1. T1, T2, T3 are Terminals of Compressor
2. K1, K2, K3 are Contractor (by customer)
3. CT is Current Transformer
4. Q1 is Breaker (by customer)
5. KA is Intermediate Relay

INVOTECH
GREEN FROST LLC
No 1, Chernomorskaya str., Kiev, 04080 Ukraine
TEL/FAX: +38 044 5015730
Email: ukraine@invotech.biz

www.invotech.biz

Every effort has been made to provide accurate descriptions and data.
However, due to the continuing process of product improvement and evolvement,
all information in this brochure is subject to change without notification.

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