Electrical Control Valves Series EX4, EX5, EX6, EX7 & EX8

Features

- Multifunction as expansion valve, hot gas bypass, suction gas throttling, head pressure, liquid level actuator etc.
- Fully hermetic design (no thread joints between valve body and motor compartment)
- Applicable to all common refrigerants (HCFC, HFC) and for subcritical CO_2 applications
- Stepper motor driven
- Short opening and closing time
- Very fast full-stroke time
- High resolution and excellent repeatability
- Positive shut-off function to eliminate the need for additional solenoid valve
- Bi-flow versions for heat pump applications
- High linear flow capacity
- Extremely wide capacity range (10 ... 100%)
- Continuous modulation of mass flow, no stress (liquid hammering) in the refrigeration circuit
- Direct coupling of motor and valve for high reliability (no gear mechanism)
- Ceramic slide and port for highly accurate flow and minimal wear
- Europe patent No. 0743476, USA patent No. 5735501, Japan patent No. 28225789
- Balanced force design
- Corrosion resistant stainless steel body and stainless steel connections
- PS: EX4-EX7 60 bar, EX8 45 bar
- Liquid Inlet Temperature TS: Uniflow: -50 to +100°C, Biflow: -40 to +80°C


EX5


EX4


EX7


EX6


EX8

Selection Chart (Capacities see following pages)

Type	Part No.	Flow Pattern	Capacity Range	Inlet Connection	Outlet Connection	Electrical Connection
EX4-I21	**800 615**	Uni-flow	10 ... 100%	⅜" ODF	⅝" ODF	M12 Plug
EX4-M21	**800 616**			10mm ODF	16mm ODF	
EX5-U21	**800 618**			⅝" (16mm) ODF	⅞" (22mm) ODF	
EX6-I21	**800 620**			⅞" ODF	1-⅛" ODF	
EX6-M21	**800 621**			22mm ODF	28 mm ODF	
EX7-I21	**800 624**			1-⅛" ODF	1-⅜" ODF	
EX7-M21	**800 625**			28mm ODF	35mm ODF	
EX8-M21	**800 629**			42mm ODF	42mm ODF	
EX8-U21	**800 630**			1-⅜" (35mm) ODF	1-⅜" (35mm) ODF	
EX8-I21	**800 631**			1-⅝" ODF	1-⅝" ODF	
EX4-U31	**800 617**	Bi-flow (Heat Pump)		⅝" (16mm) ODF	⅝" (16mm) ODF	
EX5-U31	**800 619**			⅞" (16mm) ODF	⅞" (22mm) ODF	
EX6-I31	**800 622**			1-⅛" ODF	1-⅛" ODF	
EX6-M31	**800 623**			28mm ODF	28mm ODF	
EX7-U31	**800 626**			1-⅜" (35mm) ODF	1-⅜" (35mm) ODF	

Cable Connector Assemblies

Type	Part No.	Temperature Range	Length	Connector type to valve	Connector type to driver or controller	Illustration
EXV-M15	**804 663**	-50 ... +80°C	1.5 m	M12, 4 pins	Loose wires	
EXV-M30	**804 664**		3.0 m			
EXV-M60	**804 665**		6.0 m			

Capacity Data

Application Expansion Valve and Liquid Injection Valve
Nominal Capacity kW

Valve Type	R407C	R22	R134a	R404A	R410A	R23 *	R124 *	R744	R407F
EX4	2 .. 17.4	2 .. 16.5	1 .. 12.8	1 .. 11.5	2 .. 19.3	2 .. 17.8	1 .. 9.2	3 .. 33.5	18
EX5	5 .. 53	5 .. 50	4 .. 39	4 .. 35	6 .. 58	5 .. 54	3 .. 28	10 .. 102	56
EX6	15 .. 126	15 .. 120	10 .. 93	10 .. 84	15 .. 140	13 .. 130	7 .. 67	24 .. 244	134
EX7	35 .. 347	35 .. 330	25 .. 255	25 .. 230	40 .. 385	-	-	70 .. 670	369
EX8	100 .. 925	90 .. 880	70 .. 680	60 .. 613	100 .. 1027	-	-	180 .. 1789	984

* Biflow versions are not released for R124 and R23
Capacity for biflow versions identical in both flow directions.

The nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling
R407C, R407F	+4°C (dew point)	+38°C bubble point / +43°C dew point	1K
R22, R134a, R404A, R410A	+4°C	+38°C	1K
R124	+20°C	+80°C	1K
R23	-60°C	-25°C	1K
R744	-40°C	-10°C	1K

Guideline for Selection of Electrical Control Valves as Expansion Valves

Controls Navigator
For easy and quick selection of Electrical Control Valves as Expansion Valves, the "Controls Navigator" selection tool can be downloaded from the Internet at www.emersonclimate.eu, or use the quick selection tables on the following pages.

The following guideline should be taken into consideration in order to obtain full advantages of the control valves:

- **Published capacities are maximum and there are no reserve capacities**
- Larger size of valve leads to shorter pull-down period and shorter travel time i.e., faster response. For example, the EX7 has a maximum travel time of 3.2 seconds. The valve has approximately 1.6 seconds travel time at 50% capacity operation.

For controllers, see chapter "Electronic Controllers and Sensors".

Example:
System with R407C having two different operating conditions:
A) 110 kW capacity at +4°C/+50°C with two stages compressor at 50% / 100% capacity
B) 137 kW capacity at +4°C/+30°C with two stages compressor at 50% / 100% capacity
The EX6 with 126 kW covers condition A, however is not sufficient to cover condition B. It is recommended to select larger valve i. e. the EX7 with 337 kW at condition A and 293 kW at condition B.

Condition A:

Full load ratio = 110 / 337 = 33%

Partial load ratio = (110/2) / 337 = 16%

Condition B:

Full load ratio = 137 / 293 = 47%

Partial load ratio = (137/2) / 293 = 23%

The capacity ratios of system to valve are in all conditions higher than 10%. It is recommended to use the EX7 rather than the EX6.

Application Expansion Valve and Liquid Injection Valve

Condensing Temperature °C	R134a		Extended capacity (kW) Evaporating Temperature (°C)											Valve Type
	+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
+60	13	13	13	13	13	13	12	12	12	12	11	11	11	EX4
	39	39	39	39	39	39	38	37	36	35	34	33	32	EX5
	93	94	94	94	93	92	90	89	87	84	82	79	77	EX6
	255	257	258	257	255	252	248	243	237	231	224	217	210	EX7
	679	686	688	686	680	672	661	648	633	616	598	580	560	EX8
+55	12	13	13	13	13	13	13	12	12	12	12	11	11	EX4
	38	39	39	39	39	39	38	38	37	36	35	34	33	EX5
	91	92	93	94	93	93	92	90	88	86	84	82	80	EX6
	249	253	256	257	256	254	251	247	242	237	231	225	218	EX7
	663	676	683	685	683	678	670	659	647	632	616	599	582	EX8
+50	12	12	13	13	13	13	13	12	12	12	12	12	11	EX4
	36	38	38	39	39	39	38	38	37	37	36	35	34	EX5
	87	90	91	92	93	92	92	91	89	88	86	84	81	EX6
	238	246	250	253	254	253	251	249	245	240	235	229	223	EX7
	636	655	668	675	677	676	671	663	653	640	627	611	595	EX8
+45	11	12	12	12	12	13	12	12	12	12	12	12	11	EX4
	34	36	37	38	38	38	38	38	37	37	36	35	35	EX5
	81	85	88	90	91	91	91	90	89	88	86	84	82	EX6
	223	234	241	246	248	249	249	247	244	240	236	231	226	EX7
	595	623	642	655	662	664	663	658	651	641	629	616	602	EX8
+40	10	11	11	12	12	12	12	12	12	12	12	12	11	EX4
	31	33	35	36	37	37	37	37	37	36	36	35	34	EX5
	74	79	83	85	87	88	89	88	88	87	85	84	82	EX6
	202	217	227	234	239	242	243	242	240	238	234	230	225	EX7
	539	578	606	625	638	645	647	646	641	634	625	614	601	EX8
+35	9	10	10	11	11	12	12	12	12	12	12	11	11	EX4
	27	30	32	34	35	35	36	36	36	36	35	35	34	EX5
	63	71	76	80	83	84	85	86	85	85	84	83	81	EX6
	173	194	209	219	226	231	234	235	234	232	230	227	223	EX7
	463	517	556	584	604	616	623	625	624	620	613	604	594	EX8
+30	7	8	9	10	11	11	11	11	11	11	11	11	11	EX4
	20	25	28	30	32	33	34	34	34	34	34	34	33	EX5
	49	60	67	73	76	79	81	82	82	82	81	80	79	EX6
	133	164	184	199	210	217	221	224	225	224	223	221	217	EX7
	356	436	492	534	559	578	590	597	600	599	595	588	580	EX8
+25	3	6	8	9	9	10	10	11	11	11	11	11	11	EX4
	10	18	23	26	29	30	31	32	33	33	33	32	32	EX5
	23	121	152	137	188	198	206	210	213	214	213	212	210	EX6
	63	121	152	173	188	198	206	210	213	214	213	212	210	EX7
	169	322	406	462	501	529	548	560	567	570	569	565	559	EX8
+20		2	5	7	8	9	9	10	10	10	10	10	10	EX4
		5	16	21	25	27	28	29	30	31	31	31	31	EX5
		12	38	51	58	64	68	70	72	73	73	73	73	EX6
		34	105	139	160	175	186	193	197	200	201	201	199	EX7
		90	281	370	427	467	495	514	526	533	536	535	532	EX8
+15				4	6	7	8	9	9	9	9	9	9	EX4
				13	19	22	25	26	27	28	28	29	29	EX5
				32	45	53	59	62	65	67	68	68	68	EX6
				87	123	145	161	171	178	183	186	187	187	EX7
				231	328	388	428	456	475	488	495	498	498	EX8
+10					3	5	6	7	8	8	8	9	9	EX4
					9	16	20	22	24	25	26	26	26	EX5
					22	38	47	52	56	59	61	62	62	EX6
					61	104	128	144	155	162	167	170	171	EX7
					162	277	341	384	413	432	445	452	455	EX8

Application Expansion Valve and Liquid Injection Valve

Condensing Temperature °C	R22		Extended capacity (kW) Evaporating Temperature (°C)											Valve Type
	+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
+60	17	17	18	18	18	18	18	18	18	17	17	17	17	EX4
	51	52	53	54	54	54	54	54	53	53	52	52	51	EX5
	123	126	128	129	130	130	130	129	128	127	126	124	122	EX6
	337	345	351	355	357	358	357	356	353	350	345	340	335	EX7
	900	921	936	946	952	954	953	948	941	932	921	908	893	EX8
+55	16	17	17	18	18	18	18	18	18	18	17	17	17	EX4
	50	51	52	53	54	54	54	54	54	53	53	52	52	EX5
	119	123	126	128	129	130	130	130	129	128	127	126	124	EX6
	328	339	346	352	355	357	358	357	356	353	350	345	340	EX7
	876	903	923	938	948	953	955	953	949	941	932	921	908	EX8
+50	16	16	17	17	18	18	18	18	18	18	18	17	17	EX4
	48	50	51	52	53	54	54	54	54	54	53	53	52	EX5
	114	119	123	125	127	129	129	129	129	128	127	126	125	EX6
	314	327	337	345	350	354	355	356	355	353	351	347	343	EX7
	838	873	899	919	933	943	948	949	947	942	935	925	914	EX8
+45	15	16	16	17	17	17	17	18	18	18	17	17	17	EX4
	45	47	49	51	52	52	53	53	53	53	53	52	52	EX5
	107	113	118	121	124	126	127	128	128	127	127	126	124	EX6
	295	311	324	334	341	346	349	351	351	350	348	346	342	EX7
	787	830	864	890	909	923	932	936	937	934	929	922	912	EX8
+40	13	15	15	16	16	17	17	17	17	17	17	17	17	EX4
	41	44	46	48	50	51	52	52	52	52	52	52	51	EX5
	98	106	111	116	119	122	124	125	125	125	125	124	123	EX6
	270	290	306	319	328	335	340	343	345	345	344	342	339	EX7
	719	774	817	850	875	894	907	915	919	919	916	911	903	EX8
+35	12	13	14	15	16	16	16	17	17	17	17	17	17	EX4
	36	40	43	45	47	49	50	50	51	51	51	51	50	EX5
	86	96	103	109	113	117	119	121	122	122	122	122	121	EX6
	237	264	284	300	312	321	327	332	335	336	336	335	333	EX7
	632	703	757	799	831	856	873	885	893	896	896	893	888	EX8
+30	10	11	13	14	15	15	16	16	16	16	16	16	16	EX4
	29	35	39	42	44	46	47	48	49	49	49	49	49	EX5
	70	83	93	100	106	110	113	116	117	118	118	118	118	EX6
	194	229	256	276	291	303	312	318	322	325	326	326	324	EX7
	516	611	682	735	776	808	831	848	859	866	869	868	865	EX8
+25	7	9	11	12	13	14	15	15	15	16	16	16	16	EX4
	20	28	33	37	40	43	44	46	46	47	47	48	48	EX5
	47	67	80	90	97	102	106	109	112	113	114	114	114	EX6
	130	184	220	246	266	281	292	301	307	311	313	314	314	EX7
	347	491	587	656	709	749	779	802	818	829	835	837	836	EX8
+20		6	9	10	12	13	13	14	14	15	15	15	15	EX4
		18	26	32	36	39	41	42	44	45	45	45	46	EX5
		43	63	76	85	93	98	102	105	107	108	109	109	EX6
		117	173	209	235	254	269	280	288	294	298	300	300	EX7
		312	461	557	627	678	718	747	768	784	793	799	801	EX8
+15			5	8	10	11	12	13	13	14	14	14	14	EX4
			15	24	30	34	37	39	40	42	42	43	43	EX5
			37	58	71	81	88	93	97	100	102	103	104	EX6
			101	160	196	222	241	256	266	274	279	283	285	EX7
			269	426	524	593	644	682	710	731	745	754	759	EX8
+10				4	7	9	10	11	12	13	13	13	13	EX4
				12	22	28	31	34	36	38	39	40	40	EX5
				29	53	66	76	82	87	91	94	96	97	EX6
				80	145	182	208	227	241	251	258	263	267	EX7
				214	386	485	554	604	642	669	689	702	711	EX8

Application Expansion Valve and Liquid Injection Valve

Condensing Temperature °C	R404A / R507			Extended capacity (kW) Evaporating Temperature (°C)										Valve Type
	+15	10+	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
+60	9	9	9	9	9	9	9	8	8	8	7	7	6	EX4
	28	28	28	28	28	27	26	25	24	23	22	21	20	EX5
	68	68	68	67	66	65	63	61	58	56	33	50	47	EX6
	186	187	186	184	181	177	172	166	160	153	145	137	129	EX7
	495	498	496	491	482	471	458	443	425	407	387	366	344	EX8
+55	10	10	10	10	10	10	10	9	9	9	8	8	8	EX4
	30	31	31	31	30	30	29	29	28	27	26	25	23	EX5
	72	73	74	74	73	72	70	69	67	64	62	59	56	EX6
	198	201	202	202	200	197	193	188	182	176	169	162	154	EX7
	527	535	538	537	533	525	514	501	486	470	451	432	411	EX8
+50	10	10	11	11	11	11	10	10	10	10	9	9	9	EX4
	31	32	32	32	32	32	32	31	30	30	29	28	27	EX5
	74	76	77	78	78	77	76	75	73	71	69	66	64	EX6
	203	208	211	213	219	211	208	204	200	194	188	181	174	EX7
	541	555	564	567	567	562	555	545	532	518	501	484	465	EX8
+45	10	10	11	11	11	11	11	11	11	10	10	10	9	EX4
	31	32	33	33	33	33	33	33	32	32	31	30	29	EX5
	74	77	79	80	80	80	80	79	78	76	74	72	69	EX6
	201	210	215	219	220	220	219	216	212	208	202	196	190	EX7
	537	559	574	583	587	586	582	575	566	553	539	524	506	EX8
+40	10	10	11	11	11	11	11	11	11	11	11	10	10	EX4
	29	31	33	33	34	34	34	34	34	33	32	32	31	EX5
	71	75	78	80	81	82	82	81	81	79	78	76	74	EX6
	193	205	214	219	223	225	225	223	221	217	213	208	202	EX7
	515	547	570	585	594	598	598	595	588	578	567	553	538	EX8
+35	9	10	10	11	11	11	11	11	11	11	11	11	11	EX4
	27	30	31	33	34	34	34	34	34	34	33	33	32	EX5
	65	71	75	79	81	82	83	83	82	81	80	79	77	EX6
	178	195	207	215	221	225	226	226	225	223	219	215	210	EX7
	474	519	551	574	590	599	603	604	600	594	585	573	560	EX8
+30	8	9	10	10	11	11	11	11	11	11	11	11	11	EX4
	23	27	30	31	33	34	34	34	34	34	34	33	33	EX5
	56	65	71	75	78	81	82	83	83	82	81	80	79	EX6
	153	177	194	206	215	221	224	226	226	225	223	219	215	EX7
	409	472	517	550	573	588	598	603	603	600	593	584	573	EX8
+25	6	8	9	10	10	11	11	11	11	11	11	11	11	EX4
	17	23	27	29	31	32	33	34	34	34	34	34	33	EX5
	42	55	64	70	74	78	80	81	82	82	81	80	79	EX6
	114	150	174	191	204	213	218	222	224	224	223	220	217	EX7
	305	400	465	510	543	566	582	592	596	597	593	587	579	EX8
+20	1	5	7	8	9	10	10	11	11	11	11	11	11	EX4
	3	16	22	26	28	30	32	33	33	33	33	33	33	EX5
	8	40	53	62	68	73	76	78	80	80	80	80	79	EX6
	21	108	146	170	187	200	208	214	218	219	220	218	216	EX7
	56	289	388	453	499	532	555	571	580	585	585	582	576	EX8
+15			5	7	8	9	10	10	10	11	11	11	11	EX4
			15	21	25	28	29	31	32	32	32	33	32	EX5
			37	51	60	66	71	74	76	77	78	78	78	EX6
			101	139	164	181	194	202	208	212	213	214	213	EX7
			268	371	437	484	516	540	555	564	569	569	566	EX8
+10				5	7	8	9	9	10	10	10	10	10	EX4
				14	20	24	26	28	30	31	31	31	31	EX5
				33	48	57	64	68	71	73	75	75	75	EX6
				91	131	156	174	186	195	201	204	206	206	EX7
				242	350	417	464	496	519	535	544	548	549	EX8

Application Expansion Valve and Liquid Injection Valve

Condensing Temperature°C		R407C		Extended capacity (kW) Evaporating Temperature (°C)											Valve Type
Dew Point	Bubble Point	+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
+64	+60	16	17	17	17	17	17	16	16	16	15	15	15	14	EX4
		50	51	51	51	51	50	50	49	48	47	46	45	43	EX5
		119	120	121	121	121	119	118	116	114	112	109	106	103	EX6
		328	332	333	333	332	329	325	320	314	308	301	293	285	EX7
		874	884	889	889	885	877	867	854	838	821	802	781	759	EX8
+59	+55	17	17	17	17	17	17	17	17	16	16	16	15	15	EX4
		50	51	52	52	52	52	51	51	50	49	48	47	46	EX5
		120	122	123	124	124	123	122	121	119	117	114	112	109	EX6
		330	336	339	341	341	339	336	332	328	322	315	308	301	EX7
		879	895	904	909	908	904	897	886	873	858	840	821	801	EX8
+54	+50	16	17	17	17	17	17	17	17	17	17	16	16	16	EX4
		50	51	52	52	53	53	52	52	51	51	50	49	48	EX5
		118	121	123	125	125	125	125	123	122	120	118	116	113	EX6
		326	334	340	343	345	345	343	340	336	331	325	319	312	EX7
		869	891	906	915	919	919	914	907	896	883	868	851	832	EX8
+50	+45	16	16	17	17	17	17	17	17	17	17	17	16	16	EX4
		48	50	51	52	53	53	53	52	52	51	51	50	49	EX5
		115	119	122	124	125	125	125	125	124	122	120	118	116	EX6
		316	327	336	341	344	346	345	344	341	337	332	326	320	EX7
		843	873	894	909	918	921	920	916	908	897	884	869	853	EX8
+45	+40	15	16	16	17	17	17	17	17	17	17	17	17	16	EX4
		46	48	50	51	52	52	52	52	52	52	51	50	49	EX5
		109	114	118	121	123	124	125	125	124	123	121	120	118	EX6
		300	315	326	334	339	342	344	343	341	338	334	330	324	EX7
		801	840	870	891	905	913	916	915	910	902	891	878	864	EX8
+40	+35	14	15	16	16	17	17	17	17	17	17	17	17	16	EX4
		42	45	48	49	50	51	52	52	52	51	51	50	50	EX5
		101	108	113	117	120	122	123	123	123	122	121	120	118	EX6
		278	297	312	323	330	335	338	339	338	337	334	330	325	EX7
		742	793	832	860	880	894	901	904	902	897	889	879	866	EX8
+35	+30	12	14	15	15	16	16	16	17	17	17	17	16	16	EX4
		38	42	45	47	48	49	50	51	51	51	50	50	49	EX5
		90	99	106	111	115	118	119	120	121	120	120	119	117	EX6
		248	273	292	306	317	324	329	331	332	331	329	326	323	EX7
		661	729	779	817	844	864	876	883	885	884	878	870	860	EX8
+30	+25	10	12	13	14	15	15	16	16	16	16	16	16	16	EX4
		32	37	41	44	46	47	48	49	49	49	49	49	48	EX5
		75	88	97	103	108	112	115	116	117	117	117	116	115	EX6
		207	241	266	285	299	309	316	320	322	323	322	320	317	EX7
		552	644	710	760	796	823	841	853	860	861	859	854	846	EX8
+26	+20	7	10	12	13	14	14	15	15	16	16	16	16	15	EX4
		23	30	36	39	42	44	46	47	47	48	48	48	47	EX5
		54	72	85	94	100	105	108	111	112	113	113	113	112	EX6
		148	199	233	258	276	289	299	305	309	312	312	311	309	EX7
		395	530	621	687	735	770	796	814	825	831	832	829	824	EX8
+21	+15		7	9	11	12	13	14	14	15	15	15	15	15	EX4
			21	29	34	38	40	42	44	45	45	46	46	46	EX5
			50	69	81	90	96	101	104	106	108	108	108	108	EX6
			137	189	223	247	265	277	287	293	297	299	299	298	EX7
			365	503	594	658	705	740	764	781	791	796	796	795	EX8
+16	+10			6	9	11	12	13	13	14	14	14	14	14	EX4
				19	27	32	36	38	40	42	43	43	43	43	EX5
				45	64	76	85	91	96	99	101	103	103	103	EX6
				123	176	210	234	251	264	273	279	282	282	284	EX7
				329	470	561	624	670	704	727	743	753	753	758	EX8

Application Expansion Valve and Liquid Injection Valve

Condensing Temperature °C	R410A		Extended capacity (kW) Evaporating Temperature (°C)											Valve Type
	+15	+10	+5	0	-5	-10	-15	-20	18	-30	-35	-40	-45	
+60	17	17	18	18	18	18	18	18	18	18	17	17	17	EX4
	51	52	53	54	54	54	54	54	53	53	52	51	50	EX5
	123	126	129	130	131	131	131	130	129	127	125	123	120	EX6
	339	348	354	358	360	361	360	358	354	350	344	338	331	EX7
	-	-	-	-	-	-	-	-	-	-	-	-	-	EX8
+55	18	18	19	19	19	19	19	19	19	19	19	18	18	EX4
	53	55	56	57	57	58	58	58	57	57	56	55	54	EX5
	127	132	135	137	138	139	139	139	138	137	135	133	131	EX6
	350	362	370	377	381	383	383	382	380	377	372	366	360	EX7
	935	965	988	1005	1016	1021	1023	1020	1014	1005	992	978	961	EX8
+50	18	18	19	19	20	20	20	20	20	20	20	19	19	EX4
	53	55	57	58	59	60	60	60	60	59	59	58	57	EX5
	128	133	137	140	142	144	145	145	144	143	142	140	138	EX6
	351	366	377	386	392	396	398	398	397	394	391	386	380	EX7
	936	975	1006	1029	1045	1056	1061	1062	1059	1052	1043	1030	1015	EX8
+45	17	18	19	19	20	20	20	20	20	20	20	20	20	EX4
	52	54	57	58	60	60	61	61	61	61	61	60	59	EX5
	124	131	136	141	144	146	147	148	148	147	146	145	143	EX6
	342	361	375	387	395	401	405	407	407	405	403	399	394	EX7
	913	962	1001	1031	1054	1070	1080	1085	1085	1082	1075	1064	1052	EX8
+40	16	17	18	19	20	20	20	21	21	21	21	20	20	EX4
	49	52	55	57	59	60	61	62	62	62	62	61	61	EX5
	118	126	133	138	142	145	147	149	149	149	149	148	146	EX6
	324	348	366	381	392	400	406	409	411	411	409	406	402	EX7
	864	927	977	1015	1045	1067	1082	1091	1095	1095	1091	1084	1073	EX8
+35	15	16	18	18	19	20	20	20	21	21	21	20	20	EX4
	45	49	53	55	58	59	60	61	62	62	62	62	61	EX5
	108	118	127	134	139	143	146	148	149	149	149	149	148	EX6
	296	326	349	368	382	393	401	406	409	411	410	409	406	EX7
	789	869	932	981	1019	1048	1069	1083	1092	1095	1095	1090	1082	EX8
+30	13	15	16	17	18	19	20	20	20	20	20	20	20	EX4
	38	44	49	52	55	57	59	60	61	61	61	61	61	EX5
	93	107	118	126	133	138	142	145	147	148	148	148	147	EX6
	255	294	325	348	366	380	390	398	403	406	407	406	405	EX7
	680	786	866	928	976	1013	1041	1061	1075	1083	1086	1084	1079	EX8
+25	10	13	15	16	17	18	19	19	20	20	20	20	20	EX4
	29	38	44	48	52	54	56	58	59	60	60	60	60	EX5
	71	91	106	117	125	131	136	140	143	144	145	146	145	EX6
	195	251	291	321	344	361	375	385	392	397	399	400	399	EX7
	520	669	775	855	916	964	1000	1027	1046	1058	1065	1067	1065	EX8
+20	4	9	12	14	16	17	18	18	19	19	19	20	20	EX4
	13	28	37	43	47	51	53	55	57	58	58	59	59	EX5
	31	68	89	103	114	122	129	133	137	139	141	142	142	EX6
	84	188	244	284	314	337	354	367	377	383	388	390	390	EX7
	225	501	652	758	837	898	944	979	1005	1023	1034	1040	1042	EX8
+15		3	9	12	14	15	16	17	18	18	19	19	19	EX4
		10	27	36	42	46	49	52	54	55	56	57	57	EX5
		23	65	86	100	111	119	125	130	133	135	137	137	EX6
		64	178	236	276	305	327	344	357	366	372	376	378	EX7
		172	475	629	735	813	873	917	951	976	992	1003	1008	EX8
+10			1	8	11	13	15	16	17	17	18	18	18	EX4
			4	25	34	40	44	47	50	52	53	54	55	EX5
			10	60	82	96	107	115	121	125	128	130	132	EX6
			28	166	225	265	294	315	332	344	352	358	362	EX7
			76	443	600	706	783	841	885	917	940	956	965	EX8

Application Expansion Valve and Liquid Injection Valve

Condensing Temperature °C	R124	Extended capacity (kW) Evaporating Temperature (°C)						Valve Type
	+30	+25	+20	+15	+10	+5	0	
+100	7	7	7	6	6	6	5	EX4
	22	21	20	19	18	17	16	EX5
	53	51	49	47	44	42	39	EX6
+95	8	8	7	7	7	7	6	EX4
	24	23	23	22	21	20	19	EX5
	57	56	54	52	50	47	45	EX6
+90	8	8	8	8	7	7	7	EX4
	25	25	24	24	23	22	21	EX5
	61	59	58	56	54	52	50	EX6
+85	9	9	8	8	8	8	7	EX4
	26	26	25	25	24	23	23	EX5
	63	62	61	60	58	56	54	EX6
+80	9	9	9	8	8	8	8	EX4
	27	27	26	26	25	25	24	EX5
	64	63	63	62	61	59	57	EX6
+75	9	9	9	9	9	8	8	EX4
	27	27	27	26	26	25	25	EX5
	64	64	64	63	62	61	60	EX6
+70	9	9	9	9	9	9	8	EX4
	26	26	27	27	26	26	25	EX5
	62	63	64	63	63	62	61	EX6
+65	8	8	9	9	9	9	8	EX4
	25	26	26	26	26	26	26	EX5
	60	61	62	63	63	62	62	EX6
+60	8	8	8	8	8	8	8	EX4
	23	24	25	26	26	26	26	EX5
	56	58	60	61	62	62	61	EX6

Condensing Temperature °C	R23		Extended capacity (kW) Evaporating Temperature (°C)										Valve Type
	-45	-50	-55	-60	-65	-70	-75	-80	-85	-90	-95	-100	
-10	17	18	19	19	19	19	19	19	19	19	19	18	EX4
	53	55	56	57	58	58	58	58	58	57	57	56	EX5
	127	132	135	138	139	140	140	140	139	138	137	135	EX6
-15	16	17	18	18	19	19	19	19	19	19	18	18	EX4
	50	52	54	55	56	57	57	57	57	57	56	55	EX5
	119	125	130	133	135	137	137	137	137	136	135	134	EX6
-20	15	16	17	17	18	18	18	18	18	18	18	18	EX4
	45	48	51	53	54	55	55	55	55	55	55	54	EX5
	109	117	122	127	130	132	133	134	133	133	132	131	EX6
-25	13	14	15	16	17	17	17	18	18	18	18	17	EX4
	40	44	47	49	51	52	53	53	53	53	53	53	EX5
	96	106	113	118	122	125	127	128	129	128	128	127	EX6
-30	11	13	14	15	16	16	16	17	17	17	17	17	EX4
	33	38	42	45	47	49	50	51	51	51	51	51	EX5
	78	92	101	108	114	117	120	122	122	123	123	122	EX6
-35	7	10	12	13	14	15	15	16	16	16	16	16	EX4
	22	30	36	40	43	45	46	47	48	48	48	48	EX5
	53	73	86	96	103	108	111	114	115	116	116	116	EX6
-40		6	9	11	12	13	14	14	15	15	15	15	EX4
		19	28	33	37	40	42	43	44	45	45	45	EX5
		46	67	80	90	96	101	104	106	108	108	108	EX6
-45			5	8	10	11	12	13	13	13	14	14	EX4
			15	25	30	34	37	39	40	41	41	41	EX5
			37	60	73	82	88	93	96	98	99	100	EX6

Application Expansion Valve and Liquid Injection Valve

Condensing Temperature °C	R744		Extended capacity (kW) Evaporating Temperature (°C)											Valve Type
	+8	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	
+10	5	12	18	22	26	29	31	33	34	35	36	37	38	EX4
	15	36	55	68	79	87	94	99	104	108	110	113	114	EX5
	36	86	132	164	189	208	225	238	249	257	264	269	273	EX6
	99	237	362	450	518	572	617	653	683	707	726	740	750	EX7
	-	-	-	-	-	-	-	-	-	-	-	-	-	EX8
+5			12	19	23	27	29	32	33	35	36	37	38	EX4
			37	57	71	81	90	96	102	106	110	113	115	EX5
			89	137	170	195	215	231	244	254	263	269	274	EX6
			244	376	466	535	589	634	670	699	722	739	753	EX7
			-	-	-	-	-	-	-	-	-	-	-	EX8
0				12	19	24	27	30	32	34	35	36	37	EX4
				38	58	72	83	91	98	103	107	111	113	EX5
				90	139	173	198	218	234	247	257	265	271	EX6
				247	383	475	544	598	642	677	705	727	744	EX7
				659	1023	1267	1452	1598	1715	1809	1883	1942	1987	EX8
-5					12	19	24	27	30	32	34	35	36	EX4
					97	59	73	83	91	98	103	107	110	EX5
					89	140	174	199	219	234	247	257	264	EX6
					245	385	477	547	601	644	678	705	725	EX7
					654	1028	1275	1460	1604	1718	1809	1881	1937	EX8
-10						12	19	24	27	30	32	34	35	EX4
						36	58	72	83	91	97	102	106	EX5
						87	139	173	198	217	233	245	254	EX6
						239	382	475	544	597	639	671	697	EX7
						639	1021	1269	1452	1594	1705	1793	1861	EX8
-15							11	19	23	27	29	31	33	EX4
							35	57	71	82	89	96	100	EX5
							84	137	171	195	214	229	240	EX6
							229	376	468	536	588	628	660	EX7
							613	1003	1250	1431	1570	1677	1761	EX8
-20								11	18	23	26	29	31	EX4
								33	56	70	80	87	93	EX5
								79	133	166	191	209	223	EX6
								216	365	457	523	574	613	EX7
								576	974	1220	1398	1532	1636	EX8
-25									10	18	22	25	28	EX4
									30	53	67	77	85	EX5
									72	128	161	185	202	EX6
									198	350	442	507	556	EX7
									528	935	1179	1353	1483	EX8
-30										9	17	21	24	EX4
										27	51	64	74	EX5
										64	121	154	177	EX6
										175	332	423	486	EX7
										466	887	1129	1298	EX8
-35											7	16	20	EX4
											22	47	61	EX5
											53	113	146	EX6
											145	310	400	EX7
											386	828	1068	EX8
-40												5	14	EX4
												16	43	EX5
												37	103	EX6
												103	284	EX7
												275	759	EX8

For Applications As Expansion Valve The Following Correction Factors (k_t) Related To Evaporating And Condensing Temperatures Apply

R407F		Correction factors for EXV													
		Evaporating temperature °C													
		+20	+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Liquid temperature °C	+65	1.51	1.53	1.55	1.58	1.61	1.64	1.68	1.71	1.75	1.80	1.85	1.90	1.96	2.02
	+60	1.35	1.37	1.39	1.41	1.43	1.46	1.49	1.52	1.55	1.59	1.63	1.67	1.71	1.76
	+55	1.23	1.25	1.26	1.28	1.30	1.32	1.35	1.37	1.40	1.43	1.46	1.50	1.53	1.57
	+50	1.14	1.15	1.16	1.18	1.20	1.22	1.24	1.26	1.28	1.31	1.33	1.36	1.39	1.43
	+45	1.06	1.07	1.08	1.10	1.11	1.13	1.14	1.16	1.18	1.20	1.23	1.25	1.28	1.31
	+40	0.99	1.00	1.01	1.02	1.04	1.05	1.07	1.08	1.10	1.12	1.14	1.16	1.18	1.21
	+35	0.93	0.94	0.95	0.96	0.97	0.99	1.00	1.01	1.03	1.05	1.06	1.08	1.10	1.13
	+30	0.88	0.89	0.90	0.91	0.92	0.93	0.94	0.95	0.97	0.98	1.00	1.02	1.03	1.05
	+25	0.83	0.84	0.85	0.86	0.87	0.88	0.89	0.90	0.91	0.93	0.94	0.96	0.97	0.99
	+20	0.79	0.80	0.81	0.82	0.82	0.83	0.84	0.85	0.87	0.88	0.89	0.91	0.92	0.94
	+15	0.76	0.76	0.77	0.78	0.78	0.79	0.80	0.81	0.82	0.83	0.85	0.86	0.87	0.89
	+10	0.72	0.73	0.74	0.74	0.75	0.76	0.77	0.77	0.78	0.79	0.81	0.82	0.83	0.84
	+5	0.69	0.70	0.70	0.71	0.72	0.72	0.73	0.74	0.75	0.76	0.77	0.78	0.79	0.80
	0	0.66	0.67	0.68	0.68	0.69	0.69	0.70	0.71	0.72	0.73	0.73	0.74	0.75	0.77
	-5	0.64	0.64	0.65	0.65	0.66	0.67	0.67	0.68	0.69	0.70	0.70	0.71	0.72	0.73
	-10	0.62	0.62	0.62	0.63	0.63	0.64	0.65	0.65	0.66	0.67	0.68	0.68	0.69	0.70

For Applications As Expansion Valve The Following Correction Factors ($k_{\Delta p}$) Related To The Pressure Drop At Valve Apply

	Correction factors for EXVs													
ΔP (bar)	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5
$k_{\Delta P}$	3.51	2.87	2.48	2.22	2.03	1.88	1.76	1.66	1.57	1.5	1.43	1.38	1.33	1.28

ΔP (bar)	8	9	10	11	12	13	14	15	16	17	18	19	20	21
$k_{\Delta P}$	1.24	1.17	1.11	1.06	1.01	0.97	0.94	0.91	0.88	0.85	0.83	0.81	0.79	0.77

Application Hot Gas Bypass - Nominal Capacities (kW)

Valve Type	Kv, m^3/h	R22 / R407C	R134a	R404A / R507
EX4	0.21	4.9	3.4	4.6
EX5	0.68	16	11	15
EX6	1.57	37	26	35
EX7	5.58	131	92	126
EX8	16.95	399	278	382

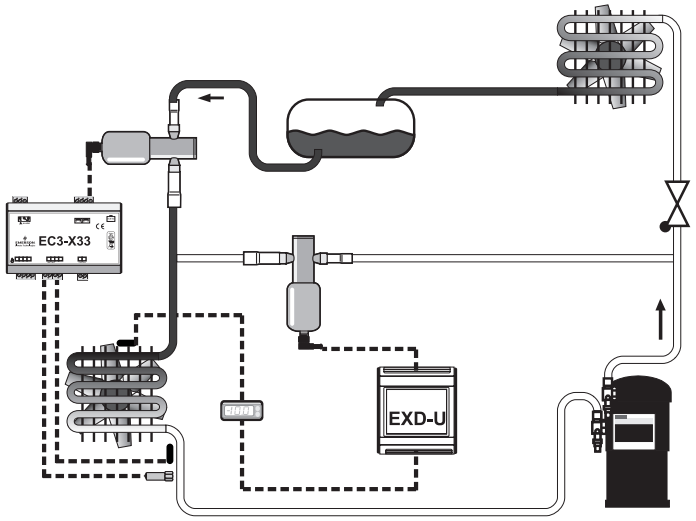
The nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling
R407C	+4°C (dew point)	+38°C bubble point / +43°C dew point	1K
R22, R134a, R404A, R507	+4°C	+38°C	1K

For other operating conditions use the "Controls Navigator" selection tool (download from www.emersonclimate.eu) or use the following quick selection tables.

Biflow versions are not released for hot gas bypass applications. EX4 .. EX8 must be installed with motor downward in hot gas line applications. This ensures the valve life expectancy. Install a check valve on main hot gas line just after branch to Control Valve.

Condensing Temperature °C	Extended Capacity kW			Valve type
	R22 / R407C	R134a	R404A / R507	
60 bubble point for all refrig (64 dew point for R407C)	7	4.9	5.8	**EX4**
	23	16	19	**EX5**
	54	38	45	**EX6**
	191	135	161	**EX7**
	581	411	488	**EX8**
50 bubble point for all refrig. (54 dew point for R407C)	6.1	4.3	5.5	**EX4**
	20	14	18	**EX5**
	46	32	41	**EX6**
	163	115	147	**EX7**
	495	348	447	**EX8**
40 bubble point for all refrig. (45 dew point for R407C)	4.9	3.7	4.9	**EX4**
	16	12	16	**EX5**
	38	27	36	**EX6**
	136	95	130	**EX7**
	414	289	394	**EX8**
30 bubble point for all refrig. (35 dew point for R407C)	4.3	2.8	4	**EX4**
	14	9	13	**EX5**
	32	22	31	**EX6**
	112	78	111	**EX7**
	340	236	336	**EX8**



Application Suction Pressure Regulation (Evaporating or Crankcase Pressure) - Nominal Capacities (kW)

Valve Type	Kv, m^3/h	R407C/R22	R134a	R404A/R507	R410A
EX6	1.57	8.6	7.1	7.6	10.4
EX7	5.58	30.6	25.2	27	36.9
EX8	16.95	92.4	76.8	82.1	112.5

The nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling	Pressure Drop
R407C	+4°C (dew point)	+38°C bubble point / +43°C dew point	1K	0.15 bar
R22, R134a, R404A	+4°C	+38°C	1K	0.15 bar

For other operating conditions use the "Controls Navigator" selection tool (download from www.emersonclimate.eu) or use the following quick selection tables.

For biflow versions attention should be paid to the temperature range TS -40°C to +80°C ! The EX6 .. EX8 must be installed with motor downward in suction line applications. This ensures the valve life expectancy.

Example:
The EX6 provides 3.5 kW at 0.15 bar pressure drop with R404A or 3.5 * 1.41=4.9 kW at 0.3 bar pressure drop.

Multiply above nominal capacities by following factors to obtain capacities at different pressure drops:

ΔP, bar	0.10	0.15	0.20	0.30
Correction factor	0.82	1.00	1.15	1.41

Typical Order Package

1) Valve EX6, EX7 or EX8
   Plug and cable assembly EXV-M60
2) Controller Kit EXD-U01 Part No. 804 750

Condensing Temperature °C	R134a	Extended capacity (kW) Evaporating Temperature (°C)				Valve Type
	+10	+5	0	-10	-20	
+60	3	2	2	2	1	**EX6**
	10	9	8	6	4	**EX7**
	30	27	24	18	13	**EX8**
+50	3	3	2	2	1	**EX6**
	11	10	9	7	5	**EX7**
	34	30	27	21	15	**EX8**
+40	3	3	3	2	2	**EX6**
	12	11	10	8	6	**EX7**
	38	34	30	23	17	**EX8**
+30	4	3	3	2	2	**EX6**
	14	12	11	8	6	**EX7**
	41	37	33	26	19	**EX8**
+20	4	4	3	3	2	**EX6**
	15	13	12	9	7	**EX7**
	45	40	36	28	21	**EX8**

Condensing Temperature °C	R22	Extended capacity (kW) Evaporating Temperature (°C)						Valve Type
	+10	+5	0	-10	-20	-30	-40	
+60	4	3	3	3	2	2	1	**EX6**
	13	12	11	9	7	5	4	**EX7**
	41	37	34	27	22	17	12	**EX8**
+50	4	4	3	3	2	2	1	**EX6**
	15	13	12	10	8	6	5	**EX7**
	45	41	37	30	24	19	14	**EX8**
+40	5	4	4	3	2	2	1	**EX6**
	16	15	13	11	9	7	5	**EX7**
	49	45	41	33	27	21	15	**EX8**
+30	5	4	4	3	3	2	2	**EX6**
	17	16	14	12	9	7	5	**EX7**
	53	48	44	36	29	22	16	**EX8**
+20	5	5	4	4	3	2	2	**EX6**
	19	17	15	13	10	8	6	**EX7**
	56	52	47	39	31	24	18	**EX8**

Application Suction Pressure Regulation (Evaporating or Crankcase Pressure)

Condensing Temperature °C	R404A/R507	Extended capacity (kW) Evaporating Temperature (°C)						Valve Type
	+10	+5	0	-10	-20	-30	-40	
+60	3	2	2	2	1	1	1	EX6
	9	8	8	6	4	3	2	EX7
	29	26	23	18	13	10	7	EX8
+50	3	3	3	2	2	1	1	EX6
	12	11	9	7	6	4	3	EX7
	36	32	29	23	18	13	9	EX8
+40	4	3	3	3	2	1	1	EX6
	14	12	11	9	7	5	4	EX7
	42	38	34	27	21	16	12	EX8
+30	4	4	4	3	2	2	1	EX6
	16	14	13	10	8	6	5	EX7
	48	43	39	31	25	19	14	EX8
+20	5	4	4	3	3	2	1	EX6
	17	16	14	12	9	7	5	EX7
	53	48	44	35	28	21	16	EX8

Condensing Temperature °C		R407C	Extended capacity (kW) Evaporating Temperature (°C)				Valve Type
Dew point	Bubble point	+10	+5	0	-10	-20	
+64	+60	3	3	3	2	2	EX6
		12	11	10	8	6	EX7
		36	33	29	23	18	EX8
+54	+50	4	3	3	2	2	EX6
		14	12	11	9	7	EX7
		41	37	34	27	21	EX8
+45	+40	4	4	3	3	2	EX6
		15	14	12	10	8	EX7
		46	42	38	30	23	EX8
+35	+30	5	4	4	3	2	EX6
		17	15	14	11	9	EX7
		51	46	41	33	26	EX8
+26	+20	5	5	4	3	3	EX6
		18	16	15	12	9	EX7
		55	50	45	36	28	EX8

Application Condensing Pressure Regulation and Liquid Duty - Nominal Capacities (kW)

Valve Type	Kv, m^3/h	R407C	R22	R134a	R404A
EX5	0.68	18	20	18	13
EX6	1.57	43	46	42	30
EX7	5.58	153	162	151	106
EX8	16.95	463	491	458	323

The nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling	Pressure Drop
R407C	+4°C (dew point)	+38°C bubble point / +43°C dew point	1K	0.35 bar
R22, R134a, R404A	+4°C	+38°C	1K	0.35 bar

Multiply above nominal capacities by following factors to obtain capacities at different pressure drops:

ΔP, bar	0.15	0.20	0.35
Correction factor	0.65	0.76	1.00

Example:
The EX6 provides 30kW at 0.35bar pressure drop with R404A or 30*0.76=22.8 kW at 0.2 bar pressure drop.

Condensing Temperature °C	R134a	Extended Capacity Evaporating Temperature (°C)			Valve type
	+10	0	-10	-20	
+60	14	13	13	12	EX5
	32	31	29	27	EX6
	115	109	104	98	EX7
	350	332	315	296	EX8
+50	16	15	15	14	EX5
	37	36	34	32	EX6
	133	127	121	115	EX7
	405	387	369	350	EX8
+30	18	18	17	16	EX5
	42	41	39	37	EX6
	151	145	139	133	EX7
	458	440	422	403	EX8
+40	20	20	19	18	EX5
	47	46	44	42	EX6
	168	162	156	150	EX7
	512	493	474	455	EX8
+20	22	22	21	20	EX5
	52	51	49	47	EX6
	186	180	173	167	EX7
	564	546	526	507	EX8

Condensing Temperature °C	R22		Extended Capacity Evaporating Temperature (°C)				Valve type
	+10	0	-10	-20	-30	-40	
+60	15	15	15	14	14	13	EX5
	36	35	34	33	32	30	EX6
	128	124	120	116	112	108	EX7
	387	377	365	353	341	328	EX8
+50	17	17	16	17	16	15	EX5
	41	40	36	39	36	35	EX6
	144	141	129	137	129	124	EX7
	439	428	391	416	391	377	EX8
+30	19	19	19	18	17	17	EX5
	45	44	43	42	41	39	EX6
	161	157	153	149	145	140	EX7
	488	477	465	453	439	426	EX8
+40	21	21	20	20	19	19	EX5
	50	49	48	46	45	44	EX6
	177	173	169	165	160	156	EX7
	536	525	513	500	486	472	EX8
+20	23	23	22	22	21	21	EX5
	54	53	52	51	49	48	EX6
	192	188	184	180	175	171	EX7
	584	572	560	547	533	519	EX8

Application Condensing Pressure Regulation and Liquid Duty

Condensing Temperature °C	R404A/507		Evaporating Temperature (°C)				Valve type
	+10	0	-10	-20	-30	-40	
+60	8	8	7	6	6	5	**EX5**
	19	17	16	15	7.6	12	**EX6**
	66	62	58	53	27	43	**EX7**
	202	189	175	160	82,1	130	**EX8**
+50	11	10	9	9	8	8	**EX5**
	24	23	22	20	19	17	**EX6**
	87	82	78	73	67	62	**EX7**
	264	250	236	220	205	189	**EX8**
+30	13	12	12	11	10	10	**EX5**
	30	28	27	26	24	23	**EX6**
	106	101	96	91	85	80	**EX7**
	321	306	291	276	260	243	**EX8**
+40	15	14	14	13	12	12	**EX5**
	35	33	32	30	29	27	**EX6**
	123	119	114	108	103	97	**EX7**
	375	360	345	329	312	295	**EX8**
+20	17	16	16	15	14	14	**EX5**
	40	38	37	35	34	32	**EX6**
	141	136	131	125	120	114	**EX7**
	427	412	397	380	363	346	**EX8**

Condensing Temperature °C		R407C	Evaporating Temperature (°C)			Valve type
Dew Point	Dew Point	+10	0	-10	-20	
+64	+60	14	13	12	12	**EX5**
		32	30	29	28	**EX6**
		112	108	103	98	**EX7**
		340	327	313	298	**EX8**
+54	+50	16	15	15	14	**EX5**
		37	36	35	33	**EX6**
		132	128	123	118	**EX7**
		402	388	373	358	**EX8**
+45	+40	18	18	17	17	**EX5**
		43	41	40	38	**EX6**
		152	147	142	137	**EX7**
		460	446	431	415	**EX8**
+35	+30	21	20	19	19	**EX5**
		48	47	45	44	**EX6**
		170	166	160	155	**EX7**
		517	503	487	471	**EX8**
+26	+20	23	22	22	21	**EX5**
		53	52	50	49	**EX6**
		189	184	179	173	**EX7**
		573	558	543	526	**EX8**

Application Hot Gas Flow such as Heat Reclaim Application - Nominal Capacities (kW)

Valve Type	Kv, m^3/h	R22 / R407C	R134a	R404A / R507	R410A
EX6	1.57	8.6	7.1	7.6	10.4
EX7	5.58	30.6	25.2	27	36.9
EX8	16.95	92.4	76.8	82.1	112.5

The nominal capacity (Q_n) is based on the following conditions:

Refrigerant	Evaporating temperature	Condensing temperature	Subcooling	Pressure Drop	Isentropic Efficiency
R407C	+4°C (dew point)	+38°C bubble point / +43°C dew point	1K	0.35 bar	80%
R22, R134a, R404A, R507	+4°C	+38°C	1K	0.35 bar	80%

For other conditions see following tables.

Valves must be installed with motor downward in hot gas line applications. This ensures the valve life expectancy. Bi-flow versions are not released for hot gas flow applications.

Condensing Temperature °C	Pressure Drop bar	R134a		Extended Capacity KW Evaporating Temperature (°C)											Valve type
		+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
+60	0.1	5	5	4	4	4	4	4	4	4	3	3	3	3	**EX6**
		16	16	16	15	15	14	14	13	13	12	12	11	10	**EX7**
		50	49	47	46	44	43	41	40	38	37	35	33	32	**EX8**
	0.5	10	10	10	9	9	9	8	8	8	7	7	7	6	**EX6**
		36	35	34	33	32	31	30	29	28	26	25	24	23	**EX7**
		110	107	104	101	97	94	91	87	84	80	77	74	70	**EX8**
	1.0	14	14	13	13	12	12	12	11	11	10	10	9	9	**EX6**
		50	49	47	46	44	43	41	40	38	37	35	34	32	**EX7**
		152	148	144	139	135	130	126	121	116	112	107	102	97	**EX8**
+50	0.1	5	4	4	4	4	4	4	4	4	3	3	3	3	**EX6**
		16	16	15	15	14	14	14	13	13	12	12	11	11	**EX7**
		49	48	47	45	44	43	41	40	39	37	36	35	33	**EX8**
	0.5	10	10	9	9	9	9	8	8	8	8	7	7	7	**EX6**
		35	35	34	33	32	31	30	29	28	27	26	25	24	**EX7**
		108	105	102	99	97	94	91	88	85	82	79	76	73	**EX8**
	1.0	14	13	13	13	12	12	12	11	11	10	10	10	9	**EX6**
		49	48	46	45	44	43	41	40	39	37	36	34	33	**EX7**
		148	145	141	137	133	129	125	121	117	113	109	105	100	**EX8**
+40	0.1	4	4	4	4	4	4	4	4	4	3	3	3	3	**EX6**
		16	15	15	14	14	14	13	13	13	12	12	11	11	**EX7**
		47	46	45	44	43	42	40	39	38	37	36	34	33	**EX8**
	0.5	10	9	9	9	9	8	8	8	8	7	7	7	7	**EX6**
		34	33	32	32	31	30	29	28	27	26	26	25	24	**EX7**
		103	100	98	96	93	91	88	86	83	80	78	75	73	**EX8**
	1.0	13	13	12	12	12	12	11	11	11	10	10	10	9	**EX6**
		46	45	44	43	42	41	40	39	38	36	35	34	33	**EX7**
		141	138	134	131	128	124	121	117	114	110	107	103	100	**EX8**
+30	0.1	4	4	4	4	4	4	4	3	3	3	3	3	3	**EX6**
		15	14	14	14	13	13	13	12	12	12	11	11	11	**EX7**
		44	43	42	42	41	40	39	38	37	35	34	33	32	**EX8**
	0.5	9	9	9	8	8	8	8	8	7	7	7	7	6	**EX6**
		32	31	30	30	29	28	28	27	26	25	25	24	23	**EX7**
		96	94	92	90	88	86	84	81	79	77	75	72	70	**EX8**
	1.0	12	12	12	11	11	11	11	10	10	10	9	9	9	**EX6**
		43	42	41	40	39	38	37	36	35	34	33	32	31	**EX7**
		130	128	125	122	119	117	114	111	108	105	102	98	95	**EX8**

Application Hot Gas Flow such as Heat Reclaim Application

Condensing Temperature °C	Pressure Drop bar	R22/R407C		Extended Capacity KW Evaporating Temperature (°C)											Valve type
		+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
+60	0.1	6	5	5	5	5	5	5	5	4	4	4	4	4	EX6
		20	19	19	18	18	17	17	16	16	15	15	14	14	EX7
		59	58	57	55	54	53	51	50	48	47	45	44	42	EX8
	0.5	12	12	12	11	11	11	10	10	10	10	9	9	9	EX6
		43	42	41	40	39	38	37	36	35	34	33	32	31	EX7
		131	129	126	123	119	116	113	110	107	103	100	97	94	EX8
	1.0	17	17	16	16	15	15	15	14	14	13	13	13	12	EX6
		60	59	58	56	55	53	52	51	49	48	46	45	43	EX7
		183	179	175	171	167	162	158	154	149	145	140	135	131	EX8
+50	0.1	5	5	5	5	5	5	5	5	4	4	4	4	4	EX6
		19	19	18	18	17	17	17	16	16	15	15	14	14	EX7
		58	57	56	54	53	52	51	49	48	47	45	44	42	EX8
	0.5	12	12	11	11	11	11	10	10	10	10	9	9	9	EX6
		42	41	40	40	39	38	37	36	35	34	33	32	31	EX7
		128	126	123	120	117	115	112	109	106	103	100	97	94	EX8
	1.0	17	16	16	15	15	15	14	14	14	13	13	13	12	EX6
		59	57	56	55	54	52	51	50	49	47	46	44	43	EX7
		178	175	171	167	163	159	155	151	147	143	139	135	131	EX8
+40	0.1	5	5	5	5	5	5	5	4	4	4	4	4	4	EX6
		18	18	18	17	17	16	16	16	15	15	15	14	14	EX7
		56	55	54	52	51	50	49	48	47	45	44	43	42	EX8
	0.5	11	11	11	11	10	10	10	10	9	9	9	9	8	EX6
		40	40	39	38	37	36	35	35	34	33	32	31	30	EX7
		123	120	118	115	113	110	108	105	103	100	97	94	92	EX8
	1.0	16	15	15	15	14	14	14	14	13	13	12	12	12	EX6
		56	55	54	53	52	50	49	48	47	46	44	43	42	EX7
		170	167	163	160	157	153	149	146	142	139	135	131	127	EX8
+30	0.1	5	5	5	5	4	4	4	4	4	4	4	4	4	EX6
		17	17	17	16	16	16	15	15	15	14	14	14	13	EX7
		53	52	51	50	49	48	46	45	44	43	42	41	40	EX8
	0.5	11	10	10	10	10	10	9	9	9	9	9	8	8	EX6
		38	37	37	36	35	34	34	33	32	31	30	30	29	EX7
		115	113	111	109	107	104	102	100	97	95	93	90	88	EX8
	1.0	15	14	14	14	14	13	13	13	12	12	12	12	11	EX6
		52	51	50	49	48	47	46	45	44	43	42	41	40	EX7
		159	156	153	150	147	144	141	138	134	131	128	124	121	EX8

* Condensing temperatures R407C:
The relation between bubble points and dew points is as follows:

Bubble point °C	Dew point °C
+60	+64
+50	+54
+40	+45
+30	+35

Application Hot Gas Flow such as Heat Reclaim Application

Condensing Temperature °C	Pressure Drop bar	R404A		Extended Capacity KW Evaporating Temperature (°C)										Valve type
		+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
+60	0.1	4	4	4	4	4	3	3	3	3	3	3	2	2	EX6
		15	14	14	13	13	12	11	11	10	10	9	8	8	EX7
		45	43	42	40	38	36	35	33	31	29	27	25	23	EX8
	0.5	9	9	8	8	8	7	7	7	6	6	6	5	5	EX6
		32	31	30	29	28	26	25	24	22	21	20	18	17	EX7
		99	95	92	88	84	80	76	72	68	64	60	56	52	EX8
	1.0	13	12	12	11	11	10	10	9	9	8	8	7	7	EX6
		45	44	42	40	39	37	35	33	31	29	27	26	24	EX7
		137	132	127	122	117	112	106	101	95	89	84	78	72	EX8
+50	0.1	5	4	4	4	4	4	4	4	3	3	3	3	3	EX6
		16	16	15	15	14	14	13	13	12	11	11	10	10	EX7
		49	47	46	44	43	41	40	38	36	35	33	31	30	EX8
	0.5	10	10	9	9	9	8	8	8	7	7	7	6	6	EX6
		35	34	33	32	31	30	29	28	26	25	24	23	22	EX7
		107	104	101	98	95	91	88	84	80	77	73	69	65	EX8
	1.0	14	13	13	13	12	12	11	11	10	10	9	9	8	EX6
		49	48	46	45	43	42	40	38	37	35	33	32	30	EX7
		149	145	141	136	131	127	122	117	112	107	102	96	91	EX8
+40	0.1	5	4	4	4	4	4	4	4	4	3	3	3	3	EX6
		16	16	16	15	15	14	14	13	13	12	12	11	11	EX7
		50	49	47	46	45	43	42	40	39	37	36	34	33	EX8
	0.5	10	10	10	9	9	9	9	8	8	8	7	7	7	EX6
		36	35	34	33	32	31	30	29	28	27	26	25	24	EX7
		109	107	104	101	98	95	92	89	86	83	79	76	73	EX8
	1.0	14	14	13	13	13	12	12	11	11	11	10	10	9	EX6
		50	49	48	46	45	44	42	41	39	38	36	35	33	EX7
		152	148	144	140	136	132	128	124	119	115	110	105	101	EX8
+30	0.1	5	4	4	4	4	4	4	4	4	4	3	3	3	EX6
		16	16	15	15	15	14	14	13	13	13	12	12	11	EX7
		49	48	47	46	45	43	42	41	40	38	37	36	34	EX8
	0.5	10	10	10	9	9	9	9	8	8	8	8	7	7	EX6
		35	35	34	33	32	31	31	30	29	28	27	26	25	EX7
		108	105	103	101	98	95	93	90	87	84	81	78	76	EX8
	1.0	14	13	13	13	13	12	12	12	11	11	10	10	10	EX6
		49	48	47	46	45	43	42	41	40	38	37	36	34	EX7
		149	146	142	139	135	132	128	124	120	117	113	109	104	EX8

Application Hot Gas Flow such as Heat Reclaim Application

Condensing Temperature °C	Pressure Drop bar	R410A		Extended Capacity KW Evaporating Temperature (°C)										Valve type
		+15	+10	+5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
+60	0.1	6	6	6	6	5	5	5	5	5	5	4	4	4	EX6
		21	21	20	20	19	19	18	18	17	16	16	15	15	EX7
		64	63	62	60	58	57	55	53	52	50	48	46	44	EX8
	0.5	13	13	13	12	12	12	11	11	11	10	10	10	9	EX6
		47	46	45	44	43	41	40	39	38	36	35	34	32	EX7
		143	140	137	133	130	126	122	118	115	111	107	103	99	EX8
	1.0	19	18	18	17	17	16	16	15	15	14	14	13	13	EX6
		66	64	63	61	60	58	56	55	53	51	49	47	46	EX7
		200	196	191	186	182	177	171	166	161	155	150	144	138	EX8
+50	0.1	6	6	6	6	6	6	5	5	5	5	5	5	4	EX6
		22	22	21	21	20	20	19	19	18	18	17	17	16	EX7
		67	66	65	63	62	60	59	57	55	54	52	50	48	EX8
	0.5	14	14	13	13	13	12	12	12	11	11	11	10	10	EX6
		49	48	47	46	45	44	43	42	40	39	38	37	35	EX7
		149	146	143	140	137	133	130	126	123	119	115	111	108	EX8
	1.0	19	19	19	18	18	17	17	16	16	15	15	14	14	EX6
		69	67	66	64	63	61	60	58	57	55	53	51	50	EX7
		209	204	200	196	191	186	182	177	172	167	161	156	151	EX8
+40	0.1	6	6	6	6	6	6	5	5	5	5	5	5	5	EX6
		22	22	21	21	20	20	19	19	18	18	17	17	16	EX7
		67	66	65	63	62	60	59	58	56	54	53	51	50	EX8
	0.5	14	13	13	13	13	12	12	12	11	11	11	11	10	EX6
		49	48	47	46	45	44	43	42	41	40	39	37	36	EX7
		148	146	143	140	137	134	131	127	124	121	117	114	110	EX8
	1.0	19	19	18	18	18	17	17	16	16	16	15	15	14	EX6
		68	67	66	64	63	61	60	59	57	55	54	52	51	EX7
		207	203	199	195	191	187	182	178	173	168	164	159	154	EX8
+30	0.1	6	6	6	6	6	5	5	5	5	5	5	5	5	EX6
		21	21	21	20	20	19	19	19	18	18	17	17	16	EX7
		65	64	63	61	60	59	58	56	55	53	52	51	49	EX8
	0.5	13	13	13	13	12	12	12	12	11	11	11	10	10	EX6
		47	46	45	45	44	43	42	41	40	39	38	37	36	EX7
		143	141	138	135	133	130	127	124	121	118	115	112	109	EX8
	1.0	18	18	18	17	17	17	16	16	16	15	15	14	14	EX6
		65	64	63	62	61	60	58	57	56	54	53	51	50	EX7
		199	195	192	188	185	181	177	173	169	165	160	156	152	EX8

Technical Data

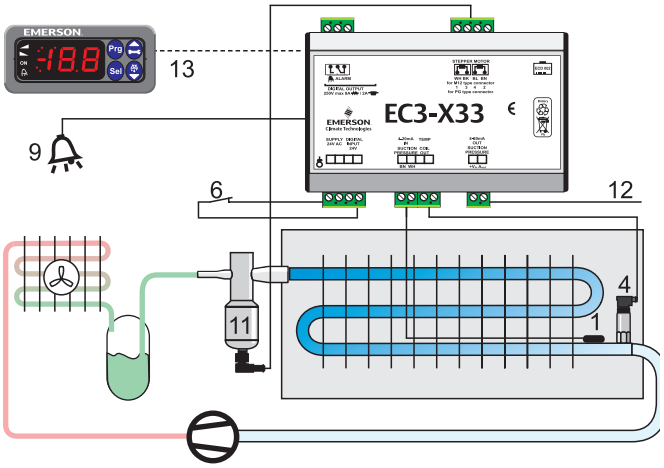
Compatibility *	HCFCs, HFCs, CO_2 Mineral and POE lubricants
MOPD (maximum operating pressure differential)	EX4/EX5/EX6: 40 bar EX7: 35 bar EX8: 30 bar
Max. allowable pressure, PS	EX4/EX5/EX6/EX7: 60 bar EX8: 45 bar
Medium temperature range: Uniflow version Biflow version	Liquid inlet temperature TS: -50 ... +100°C TS: -40 ... +80°C
Evaporating temperature range:	-100°C to +40°C (uniflow version)
Ambient temperature Storage temperature	-40 ... +55°C -40 ... +70°C
CE marking EX4/EX5 EX6/EX7/EX8	 not required required, Cat I, Module A
Salt spray test	non-corrosion stainless steel body
Humidity	5 ... 95% R.H.

* Valves are not released for use with inflammable refrigerants.

Connections	ODF stainless steel fittings
Protection accordance to IEC 529, DIN 40050	IP 67 with Alco supplied cable connector assembly
Vibration for non-connected and fastened valve	4 g (0 .. 1000 Hz, 1 Oktave /min.)
Shock	20g at 11 ms, 80g at 1 ms
Net weight	0.5 kg (EX4), 0.52 kg (EX5), 0.6 kg (EX6), 1.1 kg (EX7), 1.5 kg (EX8)
Full travel time	EX4/EX5/EX6: 1.5 sec EX7: 3.2 sec., EX8: 5.2 sec
Seat leakage	Positive shut-off better than solenoid valve
External leakage	≤ 3 g / Year
Package and delivery	Single pack, without electrical connector

Block Diagrams

Superheat Control with EC3-X33
optional display unit ECD-002



1 ECN-N60 sensor
4 PT5 pressure transmitter
6 Supply / Digital Input
9 Alarm out
11 EX4 ... EX8 valve
12 Suction pressure 4..20mA out
13 ECD-002 Display unit

Refrigerant Mass Flow Control with EXD-U