Electrical data – A, B, and C enclosures

[T2] 3 x 200-240 V AC

Normal overload (110 % 1 min/10 min)							Enclosure size			
Type code	Output current (3 x 200-240 V)		Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]			
							IP20	IP21	IP55	IP66
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 208 V	Hp @ 230 V	[A]	[W]	Chassis	Type 1	Type 12	Type 4X
P1K1	6.6	7.3	1.1	1.5	5.9	63	A2	A2*	A4/A5**	A4/A5**
P1K5	7.5	8.3	1.5	2	6.8	82	A2	A2*	A4/A5**	A4/A5**
P2K2	10.6	11.7	2.2	3	9.5	116	A2	A2*	A4/A5**	A4/A5**
P3K0	12.5	13.8	3	4	11.3	155	A3	A3*	A5	A5
P3K7	16.7	18.4	3.7	5	15.0	185	A3	A3*	A5	A5
P5K5	24.2	26.6	5.5	7.5	22.0	310	B3	B1	B1	B1
P7K5	30.8	33.9	7.5	10	28.0	310	B3	B1	B1	B1
P11K	46.2	50.8	11	15	42.0	514	B3	B1	B1	B1
P15K	59.4	65.3	15	20	54.0	602	B4	B2	B2	B2
P18K	74.8	82.3	18.5	25	68.0	737	B4	C1	C1	C1
P22K	88	96.8	22	30	80.0	845	C3	C1	C1	C1
P30K	115	127	30	40	104.0	1140	C3	C1	C1	C1
P37K	143	157	37	50	130.0	1353	C4	C2	C2	C2
P45K	170	187	45	60	154.0	1636	C4	C2	C2	C2

** Requires an IP21/Type 1 kit. Available in North America only.*
*** A4 does not accept any C options*

[T4] 3 x 380-480 V AC

Normal overload (110 % 1 min/10 min)									Enclosure size			
Type code	Output current				Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]			
	(3 x 380-440 V)		(3 x 441-480 V)						IP20	IP21	IP55	IP66
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 400 V	Hp @ 460 V	[A] @ 400 V	[W]	Chassis	Type 1	Type 12	Type 4X
P1K1	3	3.3	2.7	3	1.1	1.5	2.7	58	A2	A2	A4/A5	A4/A5
P1K5	4.1	4.5	3.4	3.7	1.5	2	3.7	62	A2	A2	A4/A5	A4/A5
P2K2	5.6	6.2	4.8	5.3	2.2	3	5.0	88	A2	A2	A4/A5	A4/A5
P3K0	7.2	7.9	6.3	6.9	3	4	6.5	116	A2	A2	A4/A5	A4/A5
P4K0	10	11	8.2	9	4	5	9.0	124	A2	A2	A4/A5	A4/A5
P5K5	13	14.3	11	12.1	5.5	7.5	11.7	187	A3	A3	A5	A5
P7K5	16	17.6	14.5	16	7.5	10	14.4	225	A3	A3	A5	A5
P11K	24	26.4	21	23.1	11	15	22.0	392	B3	B1	B1	B1
P15K	32	35.2	27	29.7	15	20	29.0	392	B3	B1	B1	B1
P18K	37.5	41.3	34	37.4	18.5	25	34.0	465	B3	B1	B1	B1
P22K	44	48.4	40	44	22	30	40.0	525	B4	B2	B2	B2
P30K	61	67.1	52	61.6	30	40	55.0	739	B4	B2	B2	B2
P37K	73	80.3	65	71.5	37	50	66.0	698	B4	C1	C1	C1
P45K	90	99	80	88	45	60	82.0	843	C3	C1	C1	C1
P55K	106	117	105	116	55	75	96.0	1083	C3	C1	C1	C1
P75K	147	162	130	143	75	100	133	1384	C4	C2	C2	C2
P90K	177	195	160	176	90	125	161	1474	C4	C2	C2	C2

[T6] 3 x 525-600 V AC

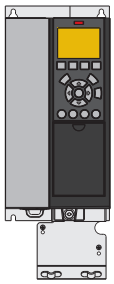
Normal overload (110 % 1 min/10 min)							Enclosure size			
Type code	Output current (3 x 525-600 V)		Typical shaft output power		Continous input current	Estimated power loss	Protection rating [IEC/UL]			
							IP20	IP21	IP55	IP66
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 575 V	Hp @ 575 V	[A]	[W]	Chassis	Type 1	Type 12	Type 4X
P1K1	2.4	2.6	1.1	1.5	2.4	50	A3	A3	A5	A5
P1K5	2.7	3	1.5	2	2.7	65	A3	A3	A5	A5
P2K2	3.9	4.3	2.2	3	4.1	92	A3	A3	A5	A5
P3K0	4.9	5.4	3	4	5.2	122	A3	A3	A5	A5
P4K0	6.1	6.7	4	5	5.8	145	A3	A3	A5	A5
P5K5	9	9.9	5.5	7.5	8.6	195	A3	A3	A5	A5
P7K5	11	12.1	7.5	10	10.4	261	A3	A3	A5	A5
P11K	18	20	11	15	17.2	300	B3	B1	B1	B1
P15K	22	24	15	20	20.9	300	B3	B1	B1	B1
P18K	27	30	18.5	25	25.4	370	B3	B1	B1	B1
P22K	34	37	22	30	32.7	440	B4	B2	B2	B2
P30K	41	45	30	40	39.0	600	B4	B2	B2	B2
P37K	52	57	37	50	49.0	740	B4	C1	C1	C1
P45K	62	68	45	60	59.0	900	C3	C1	C1	C1
P55K	83	91	55	75	78.9	1100	C3	C1	C1	C1
P75K	100	110	75	100	95.3	1500	C4	C2	C2	C2
P90K	131	144	90	125	124.3	1800	C4	C2	C2	C2

[T7] 3 x 525-690 V AC

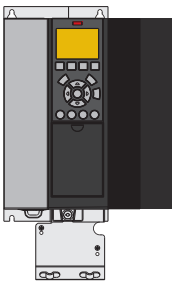
Normal overload (110 % 1 min/10 min)									Enclosure size		
Type code	Output current				Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]		
	(3 x 525-550 V)		(3 x 551-690 V)						IP20	IP21	IP55
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 690 V	Hp @ 575 V	[A] @ 690 V	[W]	Chassis	Type 1	Type 12
P1K1	2.1	2.3	1.6	1.8	1.1	1.5	1.4	44	A3	-	-
P1K5	2.7	3	2.2	2.4	1.5	2	2.0	60	A3	-	-
P2K2	3.9	4.3	3.2	3.5	2.2	3	2.9	88	A3	-	-
P3K0	4.9	5.4	4.5	5	3	4	4.0	120	A3	-	-
P4K0	6.1	6.7	5.5	6.1	4	5	4.9	160	A3	-	-
P5K5	9	9.9	7.5	8.3	5.5	7.5	6.7	220	A3	-	-
P7K5	11	12.1	10	11	7.5	10	9.0	300	A3	-	-
P11K	14	15.4	13	14.3	11	15	15.0	220	B4	B2	B2
P15K	19	20.9	18	19.8	15	20	19.5	220	B4	B2	B2
P18K	23	25.3	22	24.2	18.5	25	24.0	300	B4	B2	B2
P22K	28	30.8	27	29.7	22	30	29.0	370	B4	B2	B2
P30K	36	39.6	34	37.4	30	40	36.0	440	B4	B2	B2
P37K	43	47.3	41	45.1	37	50	49.0	740	B4	C2	C2
P45K	54	59.4	52	57.2	45	60	59.0	900	C3	C2	C2
P55K	65	71.5	62	68.2	55	75	71.0	1100	C3	C2	C2
P75K	87	95.7	83	91.3	75	100	87.0	1500	–	C2	C2
P90K	105	115.5	100	110	90	125	99.0	1800	–	C2	C2

Dimensions enclosure sizes A, B and C

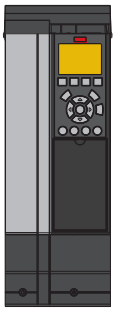
		VLT® HVAC Drive													
Enclosure size		A2		A3		A4	A5	B1	B2	B3	B4	C1	C2	C3	C4
Protection rating [IEC/UL]		IP20 Chassis	IP21 Type 1	IP20 Chassis	IP21 Type 1	IP55/Type 12 IP66/Type 4X		IP21/Type 1 IP55/Type 12 IP66/Type 4X		IP20/Chassis		IP21/Type 1 IP55/Type 12 IP66/Type 4X		IP20/Chassis	
[mm]	Height	268	375	268	375	390	420	480	650	399	520	680	770	550	660
	Height with decoupling plate	374	–	374	–	–	–	–	–	420	595	–	–	630	800
	Width	90	90	130	130	200	242	242	242	165	230	308	370	308	370
	Width with one C option	130	130	170	170	–	242	242	242	205	230	308	370	308	370
	Depth	205	207	205	207	175	200	260	260	249	242	310	335	333	333
	Depth with A, B option	220	222	220	222	175	200	260	260	262	242	310	335	333	333
	Depth with mains disconnect	–	–	–	–	206	224	289	290	–	–	344	378	–	–
[kg]	Weight	4.9	5.3	6	7	9.7	14.2	23	27	12	23.5	45	64	35	50
[in]	Height	10.6	14.8	10.6	14.8	15.4	16.6	18.9	25.6	15.8	20.5	26.8	30.4	21.7	26
	Height with decoupling plate	14.8	–	14.8	–	–	–	–	–	16.6	23.5	–	–	24.8	31.5
	Width	3.6	3.6	5.2	5.2	7.9	9.6	9.6	9.6	6.5	9.1	12.2	14.6	12.2	14.6
	Width with one C option	5.2	5.2	6.7	6.7	–	9.6	9.6	9.6	8.1	9.1	12.2	14.6	12.2	14.6
	Depth	8.1	18.2	8.1	8.2	6.9	7.9	10.3	10.3	9.8	9.6	12.3	13.2	13	13
	Depth with mains disconnect	–	–	–	–	8.2	8.9	11.4	11.5	–	–	13.6	14.9	–	–
	Depth with A, B option	8.7	8.8	8.7	8.8	6.9	7.9	10.3	10.3	10.4	9.6	12.3	13.2	13	13
[lb]	Weight	10.8	11.7	14.6	15.5	21.5	31.5	50.7	59.6	26.5	52	99.3	143.3	77.2	110.2



A3 IP20/Chassis
with decoupling plate

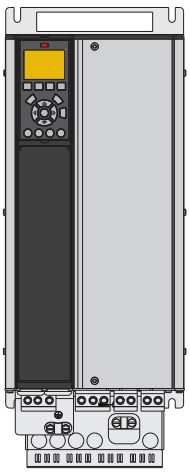


A3 IP20 with option C

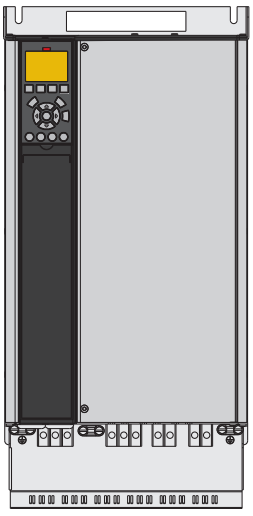


A3 with IP21/Type 12 NEMA 1 Kit

A4 IP55 with mains disconnect



B4 IP20



C3 IP20

Ordering type code for A, B and C enclosures

[1] Application *(character 4-6)*	
102	VLT® HVAC Drive FC 102
[2] Power size *(character 7-10)*	
P1K1	1.1 kW / 1.5 Hp
P1K5	1.5 kW / 2.0 Hp
P2K2	2.2 kW / 3.0 Hp
P3K0	3.0 kW / 4.0 Hp
P3K7	3.7 kW / 5.0 Hp
P4K0	4.0 kW / 5.5 Hp
P5K5	5.5 kW / 7.5 Hp
P7K5	7.5 kW / 10 Hp
P11K	11 kW / 15 Hp
P15K	15 kW / 20 Hp
P18K	18.5 kW / 25 Hp
P22K	22 kW / 30 Hp
P30K	30 kW / 40 Hp
P37K	37 kW / 50 Hp
P45K	45 kW / 60 Hp
P55K	55 kW / 75 Hp
P75K	75 kW / 100 Hp
P90K	90 kW / 125 Hp
[3] AC Line Voltage *(character 11-12)*	
T2	3 x 200-240 V AC
T4	3 x 380-480 V AC
T6	3 x 525-600 V AC
T7	3 x 525-690 V AC
[4] IP/UL protection ratings *(character 13-15)*	
IP20 / Chassis enclosures	
E20	IP20/Chassis
P20	IP20/Chassis + backplate
IP21 / UL Type 1 enclosures	
E21	IP21 / Type 1
P21	IP21 / Type 1 + backplate
IP55 / UL Type 12 enclosures	
E55	IP55/Type 12
P55	IP55/Type 12 + backplate
Y55	IP55/ Type 12 + backplate *(A4 enclosure, no C-options)*
Z55	IP55/Type 12 *(A4 enclosure, no C-options)*
UL Type 3R enclosures	
E3R	UL Type 3R *(North America only)*
P3R	UL Type 3R + backplate *(North America only)*
IP66 / UL Type 4X enclosures	
E66	IP66/Type 4X
Y66	IP66/Type 4X + backplate *(A4 enclosure, no C-options)*
Z66	IP66/Type 4X *(A4 enclosure, no C-options)*
P66	IP66/NEMA 4X Backplate

[5] RFI filter, terminal and monitoring options – EN/IEC 61800-3 *(character 16-17)*	
H1	RFI-Filter Class A1/B (C1)
H2	RFI-Filter, Class A2 (C3)
H3	RFI-Filter Class A1/B [1]
H4	RFI-Filter, Class A1 (C2)
H5	RFI-Filter, Class A2 (C3) Marine ruggedized
HX	No RFI-Filter
[6] Braking and safety *(character 18)*	
X	No brake IGBT
B	Brake IGBT
T	Safe Stop without brake
U	Brake IGBT plus Safe Stop
[7] LCP Display *(character 19)*	
X	Blank faceplate, no LCP installed
N	Numerical Local Control Panel (LCP 101)
G	Graphical Local Control Panel (LCP 102)
W	Wireless Comm Panel (LCP-103)
[8] PCB Coating – IEC 721-3-3 *(character 20)*	
X	Standard coated PCB Class 3C2
C	Coated PCB Class 3C3
[9] Mains input *(character 21)*	
X	No mains option
1	Mains disconnect *(A4, A5, B1, B2, C1 and C2 enclosures only)*
8	Mains disconnect and load sharing *(B1, B2, C1 and C2 enclosures only)*
D	Load sharing terminals *(B1, B2, C1, C2 enclosures only)*
[10] Hardware option A *(character 22)*	
X	Standard cable entries
O	Metric cable entry (threaded)
S	Imperial cable entry
[11] Hardware option B *(character 23)*	
X	No adaptation
[12] Special version *(character 24-27)*	
SXXX	Latest released standard software
LX1X	Condition Based Monitoring
[13] LCP language *(character 28)*	
X	Standard language package including English, German, French, Spanish, Danish, Italian, Finnish and others
Contact factory for other language options	
[14] A-options: Fieldbus *(character 29-30)*	
AX	No option
A0	VLT® PROFIBUS DP V1 MCA 101
A4	VLT® DeviceNet MCA 104
AG	VLT® LonWorks MCA 108
AJ	VLT® BACnet MCA 109
AL	VLT® PROFINET MCA 120
AN	VLT® EtherNet/IP MCA 121
AQ	VLT® Modbus TCP MCA 122
AK	VLT® BACnet/IP MCA 125

[15] B-options *(character 31-32)*	
BX	No option
BK	VLT® General Purpose MCB 101
BP	VLT® Relay Option MCB 105
B0	VLT® Analog I/O Option MCB 109
B2	VLT® PTC Thermistor Card MCB 112
B4	VLT® Sensor Input Card MCB 114
B5	VLT® Programmable I/O MCB 115
[16] C0-option *(character 33-34)*	
CX	No option
[17] C1-option *(character 35-36)*	
X	No C1-ption
R	VLT® Extended Relay Card MCB 113
[19] Control Power Backup Input *(character 38-39)*	
DX	No DC input installed
D0	VLT® 24 V DC Supply Option MCB 107
D1	VLT® Real-time Clock Option MCB 117

1) reduced motor cable length

Please beware that not all combinations are possible. Find help configuring your drive with the online configurator found under: ***driveconfig.danfoss.com***

Enclosure overview **D, E** and **F**

6-pulse

VLT® HVAC Drive FC 102		T2 200-240 V			T4 380-480 V			T7 525-690 V		
Type code	kW / NO	IP20	IP21	IP54	IP20	IP21	IP54	IP20	IP21	IP54
N55K	55	D3h	D1h	D1h						
N75K	75							D3h	D1h D5h D6h	D1h D5h D6h
N90K	90	D4h	D2h	D2h						
N110	110				D3h	D1h D5h D6h	D1h D5h D6h			
N132	132									
N160	160									
N200	200				D4h	D2h D7h D8h	D2h D7h D8h	D4h	D2h D7h D8h	D2h D7h D8h
N250	250									
N315	315									
N355	355				E3h	E1h	E1h			
N400	400							D4h	D2h D7h D8h	D2h D7h D8h
N450	450							E3h	E1h	E1h
N500	500				E4h	E2h	E2h			
N560	560									
N630	630									
N710	710							E4h	E2h	E2h
N800	800									
P500	500					F1/F3	F1/F3			
P560	560									
P630	630									
P710	710								F1/F3	F1/F3
P800	800					F2/F4	F2/F4			
P900	900									
P1M0	1000					F2/F4	F2/F4			
P1M2	1200								F2/F4	F2/F4
P1M4	1400									

12-pulse

VLT® HVAC Drive FC 102		T4 380-480 V				T7 525-690 V			
Type code	kW / NO	IP21	IP21 + options	IP54	IP54 + options	IP21	IP21 + options	IP54	IP54 + options
P315	315	F8	F9	F8	F9				
P355	355								
P400	400								
P450	450					F8	F9	F8	F9
P500	500	F10	F11	F10	F11				
P560	560								
P630	630								
P710	710								
P800	800	F12	F13	F12	F13	F10	F11	F10	F12
P900	900								
P1M0	1000	F12	F13	F12	F13				
P1M2	1200					F12	F13	F12	F13
P1M4	1400								

- P20/Chassis
- IP21/Type 1
- IP54/Type 12

Electrical data – D, E and F enclosures

[T2] 3 x 200-240 V AC

Normal overload (110 % 1 min/10 min)							Enclosure size		
Type code	Output current (3 x 200-240 V)		Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]		
							IP20	IP21	IP54
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	kW at 208 V	HP at 230 V	[A]	[W]	Chassis	Type 1	Type 12
N55K	190	209	55	75	183	1505	D3h	D1h	
N75K	240	264	75	100	231	2398	D3h	D1h	
N90K	302	332	90	120	291	2623	D4h	D2h	
N110	361	397	110	150	348	3284	D4h	D2h	
N150	443	487	150	200	427	4117	D4h	D2h	
N160	535	589	160	215	516	5209	D4h	D2h	

[T4] 3 x 380-480 V AC

Normal overload (110 % 1 min/10 min)									Enclosure size		
Type code	Output current				Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]		
	(3 x 380-440 V)		(3 x 441-480 V)						IP20	IP21	IP54
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 400 V	Hp @ 460 V	[A] @ 400 V	[W]	Chassis	Type 1	Type 12
N110	212	233	190	209	110	150	204	2559	D3h	D1h/D5h/D6h	
N132	260	286	240	264	132	200	251	2954	D3h	D1h/D5h/D6h	
N160	315	347	302	332	160	250	304	3770	D3h	D1h/D5h/D6h	
N200	395	435	361	397	200	300	381	4116	D4h	D2h/D7h/D8h	
N250	480	528	443	487	250	350	463	5137	D4h	D2h/D7h/D8h	
N315	588	647	535	588	315	450	567	6674	D4h	D2h/D7h/D8h	
N355	658	724	590	649	355	500	634	6928	E3h	E1h	E1h
N400	745	820	678	746	400	550	718	8036	E3h	E1h	E1h
N450	800	880	730	803	450	600	771	8783	E3h	E1h	E1h
N500	880	968	780	858	500	650	848	9473	E4h	E2h	E2h
N560	990	1089	890	979	560	750	954	11102	E4h	E2h	E2h
P500	880	968	780	858	500	650	848	10162	–	F1/F3	F1/F3
P560	990	1089	890	979	560	750	954	11822	–	F1/F3	F1/F3
P630	1120	1232	1050	1155	630	900	1079	12512	–	F1/F3	F1/F3
P710	1260	1386	1160	1276	710	1000	1214	14674	–	F1/F3	F1/F3
P800	1460	1606	1380	1518	800	1200	1407	17293	–	F2/F4	F2/F4
P1M0	1720	1892	1530	1683	1000	1350	1658	19278	–	F2/F4	F2/F4

[T7] 3 x 525-690 V AC

Normal overload (110 % 1 min/10 min)									Enclosure size		
Type code	Output current				Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]		
	(3 x 525-550 V)		(3 x 551-690 V)						IP20	IP21	IP54
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 690 V	Hp @ 575 V	[A]	[W]	Chassis	Type 1	Type 12
N75K	90	99	86	95	75	75	83	1162	D3h	D1h/D5h/D6h	
N90K	113	124	108	119	90	100	104	1428	D3h	D1h/D5h/D6h	
N110	137	151	131	144	110	125	126	1740	D3h	D1h/D5h/D6h	
N132	162	178	155	171	132	150	149	2101	D3h	D1h/D5h/D6h	
N160	201	221	192	211	160	200	185	2649	D3h	D1h/D5h/D6h	
N200	253	278	242	266	200	250	233	3074	D4h	D2h/D7h/D8h	
N250	303	333	290	319	250	300	279	3723	D4h	D2h/D7h/D8h	
N315	360	396	344	378	315	350	332	4465	D4h	D2h/D7h/D8h	
N400	418	460	400	440	400	400	385	5028	D4h	D2h/D7h/D8h	
N450	470	517	450	495	450	450	434	6062	E3h	E1h	E1h
N500	523	575	500	550	500	500	482	6879	E3h	E1h	E1h
N560	596	656	570	627	560	600	549	8076	E3h	E1h	E1h
N630	630	693	630	693	630	650	607	9208	E3h	E1h	E1h
N710	763	839	730	803	710	750	704	10346	E4h	E2h	E2h
N800	889	978	850	935	800	950	819	12723	E4h	E2h	E2h
P710	763	839	730	803	710	750	704	9212	–	F1/ F3	F1/ F3
P800	889	978	850	935	800	950	819	10659	–	F1/ F3	F1/ F3
P900	988	1087	945	1040	900	1050	911	12080	–	F1/ F3	F1/ F3
P1M0	1108	1219	1060	1166	1000	1150	1022	13305	–	F2/ F4	F2/ F4
P1M2	1317	1449	1260	1386	1200	1350	1214	15865	–	F2/ F4	F2/ F4
P1M4	1479	1627	1415	1557	1400	1550	1364	18173	–	F2/ F4	F2/ F4

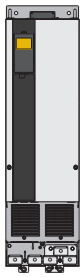
Dimensions enclosure size D

		VLT® HVAC Drive									
Enclosure size		D1h	D2h	D3h	D3h[1]	D4h	D4h[1]	D5h[2]	D6h[3]	D7h[4]	D8h[5]
Protection rating [IEC/UL]		IP21 / Type 1 IP54 / Type 12		IP20 / Chassis				IP21 / Type 1 IP54 / Type 12			
[mm]	Height	901.0	1107.0	909.0	1027	1122.0	1294	1324.0	1663.0	1978.0	2284.0
	Width	325.0	420.0	250.0	250.0	350.0	350.0	325.0	325.0	420.0	420.0
	Depth	378.4	378.4	375.0	375.0	375.0	375.0	381.0	381.0	386.0	406.0
[kg]	Weight	62.0	125.0	62.0	108.0	125.0	179.0	99.0	128.0	185.0	232.0
[in]	Height	35.5	43.6	35.8	39.6	44.2	50.0	52.1	65.5	77.9	89.9
	Width	12.8	12.8	19.8	9.9	14.8	13.8	12.8	12.8	16.5	16.5
	Depth	14.9	14.9	14.8	14.8	14.8	14.8	15.0	15.0	15.2	16.0
[lb]	Weight	136.7	275.6	136.7	238.1	275.6	394.6	218.3	282.2	407.9	511.5

[1] Dimensions when used with regeneration or load share terminals
-D5h-D8h can also be configured with Regen terminals
-D6h & D8h can also accept mains disconnect
[2] D5h is used with disconnect and/or brake chopper options
[3] D6h is used with contactor and/or circuit breaker options
[4] D7h is used with disconnect and/or brake chopper options
[5] D8h is used with contactor and/or circuit breaker options

Dimensions enclosure sizes E and F

		VLT® HVAC Drive							
Frame		E1h	E2h	E3h	E4h	F1	F2	F3	F4
Protection rating [IEC/UL]		IP21 / Type 1 IP54 / Type 12		IP20 / Chassis		IP21 / Type 1 IP54 / Type 12			
[mm]	Height	2043.0	2043.0	1578.0	1578.0	2204.0	2204.0	2204.0	2204.0
	Width	602.0	698.0	506.0	604.0	1400.0	1800.0	2000.0	2400.0
	Depth	513.0	513.0	482.0	482.0	606.0	606.0	606.0	606.0
[kg]	Weight	295.0	318.0	272.0	295.0	1017.0	1260.0	1318.0	1561.0
[in]	Height	80.4	80.4	62.1	62.1	86.8	86.8	86.8	86.8
	Width	23.7	27.5	19.9	23.9	55.2	70.9	78.8	94.5
	Depth	20.2	20.2	19.0	19.0	23.9	23.9	23.9	23.9
[lb]	Weight	650.0	700.0	600.0	650.0	2242.1	2777.9	2905.7	3441.5



D3h/D4h

E1h

F

Electrical data and dimensions – VLT® 12-Pulse

[T4] 6 x 380-480 V AC

Normal overload (110 % 1 min/10 min)									Enclosure size			
Type code	Output current				Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]			
	(3 x 380-440 V)		(3 x 441-480 V)						IP21/Type 1		IP54/Type 12	
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 400 V	Hp @ 460 V	[A] @ 400 V	[W]	Without options	With options	Without options	With options
P315	600	660	540	594	315	450	590	6790	F8	F9	F8	F9
P355	658	724	590	649	355	500	647	7701	F8	F9	F8	F9
P400	745	820	678	746	400	600	733	8879	F8	F9	F8	F9
P450	800	880	730	803	450	600	787	9670	F8	F9	F8	F9
P500	880	968	780	858	500	650	857	10647	F10	F11	F10	F11
P560	990	1089	890	979	560	750	964	12338	F10	F11	F10	F11
P630	1120	1232	1050	1155	630	900	1090	13201	F10	F11	F10	F11
P710	1260	1386	1160	1276	710	1000	1227	15436	F10	F11	F10	F11
P800	1460	1606	1380	1518	800	1200	1422	18084	F12	F13	F12	F13
P1M0	1720	1892	1530	1683	1000	1350	1675	20358	F12	F13	F12	F13

[T7] 6 x 525-690 V AC

Normal overload (110 % 1 min/10 min)									Enclosure size			
Type code	Output current				Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]			
	(3 x 525-550 V)		(3 x 551-690 V)						IP21/Type 1		IP54/Type 12	
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 690 V	Hp @ 575 V	[A] @ 690 V	[W]	Without options	With options	Without options	With options
P450	470	517	450	495	450	450	434	5529	F8	F9	F8	F9
P500	523	575	500	550	500	500	482	6239	F8	F9	F8	F9
P560	596	656	570	627	560	600	549	7653	F8	F9	F8	F9
P630	630	693	630	693	630	650	607	8495	F8	F9	F8	F9
P710	763	839	730	803	710	750	711	9863	F10	F11	F10	F11
P800	889	978	850	935	800	950	828	11304	F10	F11	F10	F11
P900	988	1087	945	1040	900	1050	920	12798	F10	F11	F10	F11
P1M0	1108	1219	1060	1166	1000	1150	1032	13801	F12	F13	F12	F13
P1M2	1317	1449	1260	1386	1200	1350	1227	16821	F12	F13	F12	F13
P1M4	1479	1627	1415	1557	1400	1550	1378	19247	F12	F13	F12	F13

Dimensions enclosure size F

		VLT® HVAC Drive					
Enclosure size		F8	F9	F10	F11	F12	F13
Protection rating [IEC/UL]		IP21 / Type 1 IP54 / Type 12					
[mm]	Height	2204.0	2204.0	2204.0	2204.0	2204.0	2204.0
	Width	800.0	1400.0	1600.0	2400.0	2000.0	2800.0
	Depth	606.0	606.0	606.0	606.0	606.0	606.0
[kg]	Weight	447.0	669.0	893.0	1116.0	1037.0	1259.0
[in]	Height	86.8	86.8	86.8	86.8	86.8	86.8
	Width	31.5	55.2	63.0	94.5	78.8	110.2
	Depth	23.9	23.9	23.9	23.9	23.9	23.9
[lb]	Weight	985.5	1474.9	1968.8	2460.4	2286.4	2775.7

Ordering type code for D, E and F enclosures

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
FC-															CX		XX	

[1] Application *(character 4-6)*	
102	VLT® HVAC Drive
[2] Power size *(character 7-10)*	
N75K	75 kW / 100 Hp
N90K	90 kW / 125 Hp
N110	110 kW / 150 Hp
N132	132 kW / 200 Hp
N160	160 kW / 250 Hp
N200	200 kW / 300 Hp
N250	250 kW / 350 Hp
N315	315 kW / 450 Hp
P315	315 kW / 450 Hp
N355	355 kW / 500 Hp
P355	355 kW / 500 Hp
N400	400 kW / 550 Hp
P400	400 kW / 550 Hp
N450	450 kW / 600 Hp
P450	450 kW / 600 Hp
N500	500 kW / 650 Hp
P500	500 kW / 650 Hp
N560	560 kW / 750 Hp
P560	560 kW / 750 Hp
N630	630 kW / 900 Hp
P630	630 kW / 900 Hp
N710	710 kW / 1000 Hp
P710	710 kW / 1000 Hp
N800	800 kW / 1200 Hp
P800	800 kW / 1200 Hp
P900	900 kW / 1250 Hp
P1M0	1.0 MW / 1350 Hp
P1M2	1.2 MW / 1600 Hp
P1M4	1.4 MW / 1900 Hp
[3] AC mains voltage *(character 11-12)*	
T2	3 x 200-240 V AC
T4	3 x 380-480 V AC
T7	3 x 525-690 V AC *690 V kW. See manuals for 575 V Hp*
[4] IP/UL protection ratings *(character 13-15)*	
IP20 / Chassis enclosures	
E21	IP21 / Type 1
E2M	IP21 / Type 1 + mains shield
E2D	IP21 / Type 1 *(D1h, D5h, D6h enclosures)*
H21	IP21 / Type 1 + space heater
C21	IP21 / Type 1 – Stainless steel back channel
C2M	IP21 / Type 1 – Stainless steel back channel + mains shield
C2D	IP21 / Type 1 – Stainless steel back channel *(D1h, D5h, D6h enclosures)*
C2H	IP21 / Type 1 – Stainless steel back channel + space heater
L2A	IP21 / Type 1 + cabinet light + 115 V power outlet
C20	IP20 Chassis
E20	IP20 Chassis
L2X	IP21 / Type 1 + cabinet light + 230 V power outlet
R2A	IP21 / Type 1 + space heater + cabinet light + 115 V power outlet
R2X	IP21 / Type 1 + space heater + cabinet light + 230 V power outlet
C2E	IP21 / Type 1 – Stainless steel back channel + Cooling out the back
C2J	IP21 / Type 1 – Stainless steel back channel + cooling out the back + space heater
E2E	IP21 / Type 1 – cooling out the back
E2J	IP21 / Type 1 – cooling out the back + space heater
IP54 / UL Type 12 enclosures	
E54	IP54 / Type 12
E5D	IP54 / Type 12 *(D1, D1h, D5h, D6h frames)*
E5M	IP54 / Type 12 + mains shield
H54	IP54 / Type 12 + space heater + thermostat
C54	IP54 / Type 12 – Stainless steel back channel
C5M	IP54 / Type 12 – Stainless steel back channel + mains shield
C5H	IP54 / Type 12 – Stainless steel back channel + space heater
L5A	IP54 / Type 12 + cabinet light + 115 V power outlet
L5X	IP54 / Type 12 + cabinet light + 230 V power outlet
R5A	IP54 / Type 12 + space heater + cabinet light + 115 V power outlet
R5X	IP54 / Type 12 + space heater + cabinet light + 230 V power outlet
E5E	IP54 / Type 12 – cooling out the back
C5E	IP54 / Type 12 – Stainless steel back channel + cooling out the back
C5J	IP54 / Type 12 – Stainless steel back channel + cooling out the back + space heater
E5J	IP54 / Type 12 – cooling out the back + space heater
E5S	IP54/Type 12 - N3R ready + Heat
IP66 / UL Type 4X enclosures	
E66	IP66 / Type 4X
Y66	IP66 / Type 4X + backplate *(no C-options)*
Z66	-
[5] RFI filter, terminal and monitoring options – EN/IEC 61800-3 *(character 16-17)*	
H2	RFI filter, Class A2 (C3)
H4	RFI filter, Class A1 (C2) *(Enclosure sizes D and F only)*
HG	IRM for IT mains with Class A2 RFI *(Enclosure sizes F1, F2, F3, F4)*
HE	RCD for TN/TT mains with Class A2 RFI *(Enclosure sizes F1, F2, F3, F4)*
HX	No RFI filter
HF	RCD for TN/TT mains and Class A1 RFI *(Enclosure sizes F1, F2, F3, F4)*
HH	IRM for IT mains and Class A1 RFI *(Enclosure sizes F1, F2, F3, F4)*
VLT® Low Harmonic Drive	
N2	VLT® Low Harmonic Drive, active filter based with Class A2 RFI
N4	VLT® Low Harmonic Drive, active filter based with Class A1 RFI
VLT® 12-Pulse, encl. sizes F8, F9, F10, F11, F12, F13	
B2	12-Pulse with Class A2 RFI
B4	12-Pulse with Class A1 RFI
BE	12-Pulse with RCD / A2 RFI
BF	12-Pulse with RCD / A1 RFI
BG	12-Pulse with IRM / A2 RFI
BH	12-Pulse with IRM / A1 RFI
[6] Braking and safety *(character 18)*	
X	No brake IGBT
B	Brake IGBT
C	Safe Torque Off with Pilz Safety Relay *(enclosure sizes F1, F2, F3, F4)*
D	Safe Torque Off with Pilz Safety Relay and brake IGBT *(enclosure sizes F1, F2, F3, F4)*
E	Safe Torque Off with Pilz Safety Relay and regeneration terminals *(enclosure sizes F1, F2, F3, F4)*
T	Safe Torque Off without brake
R	Regeneration terminals *(enclosure sizes D & F)*
S	Regeneration terminals and brake chopper
U	Brake IGBT plus Safe Torque Off
Enclosure sizes F3, F4	
M	IEC Emergency Stop Pushbutton *(includes Pilz Relay)*
N	IEC Emergency Stop Pushbutton with brake IGBT and brake terminals *(includes Pilz Safety Relay)*
P	IEC Emergency Stop Pushbutton with regeneration terminals *(includes Pilz Safety Relay)*
[7] LCP display *(character 19)*	
X	Blank faceplate, no LCP installed
N	Numerical Local Control Panel (LCP 101)
G	Graphical Local Control Panel (LCP 102)
Enclosure size D and E, IP21/IP54 only	
J	No Local Control Panel + USB through door
L	Graphical Local Control Panel (LCP 102) + USB through door
K	Numerical Local Control Panel (LCP 101) + USB through door
W	Wireless Comm Panel (LCP-103)

[8] PCB coating – IEC 721-3-3 *(character 20)*	
X	Standard coated PCB Class 3C2
C	Coated PCB Class 3C3
R	Coated PCB Class 3C3 + ruggedized

[9] Mains input *(character 21)*	
X	No mains option
7	Fuses
A	Fuses and load sharing terminals *(enclosure sizes D/IP20 and F3, F4, F9, F11, F14 only)*
D	Load sharing terminals *(enclosure sizes D/IP20 and F3, F4, F9, F11, F14 only)*
3	Mains disconnect + fuse *(enclosure sizes D, E and F3, F4, F9, F11, F14)*
4	Mains contactor + fuse *(enclosure size D)*
5	Mains disconnect, fuse and load sharing *(Not available for enclosure size)*
E	Mains disconnect + contactor + fuse *(enclosure sizes D, E and F3, F4, F9, F11, F14)*
J	Circuit breaker + fuse *(enclosure sizes D, E and F3, F4, F9, F11, F14)*
F	Mains circuit breaker, contactor and fuses *(enclosure sizes F3, F4, F9, F11, F14)*
G	Mains disconnect, contactor, load sharing terminals and fuses *(enclosure sizes F3, F4, F9, F11, F14)*
H	Mains circuit breaker, contactor, load sharing terminals and fuses *(enclosure sizes F3, F4, F9, F11, F14)*
K	Mains circuit breaker, load share and fuses *(enclosure sizes F3, F4, F9, F11, F14)*
T	Cable connection cabinet *(enclosure size D only)*
W	Cable connection cabinet and fuse *(enclosure size D only)*

[10] Hardware option A *(character 22)*	
X	Standard cable entries
Enclosure sizes F1, F2, F3, F4, F10, F11, F12, F13	
E	30 A fuse protected power terminals
F	30 A fuse protected power terminals and 2.5-4 A manual motor starter
G	30 A fuse protected power terminals and 4-6.3 A manual motor starter
H	30 A fuse protected power terminals and 6.3-10 A manual motor starter
J	30 A fuse protected power terminals and 10-16 A manual motor starter
K	Two 2.5-4 A manual motor starters
L	Two 4-6.3 A manual motor starters
M	Two 6.3-10 A manual motor starters
N	Two 10-16 A manual motor starters

[11] Hardware option B *(character 23)*	
X	No adaptation
Q	Heat sink access panel *(enclosure size D and E only)*
Enclosure sizes F1, F2, F3, F4, F10, F11, F12, F13	
G	5 A 24 V supply *(customer use)* and external temperature monitoring
H	5 A 24 V supply *(customer use)*
J	External temperature monitoring
K	Common motor terminals
L	5 A 24 V supply + common motor terminals
M	External temperature monitoring + common motor terminals
N	5 A 24 V supply + external temperature monitoring + common motor terminals

[12] Special version *(character 24-27)*	
SXXX	Latest released standard software
LX1X	Condition based monitoring

[13] LCP language *(character 28)*	
X	Standard language package including English, German, French, Spanish, Danish, Italian, Finnish and others
Contact factory for other language options	

[14] A-options: Fieldbus *(character 29-30)*	
AX	No option
A0	VLT® PROFIBUS DP MCA 101
A4	VLT® DeviceNet MCA 104
AG	VLT® LonWorks MCA 108
AJ	VLT® BACnet MCA 109
AL	VLT® PROFINET MCA 120
AN	VLT® EtherNet/IP MCA 121
AQ	VLT® Modbus TCP MCA 122
AK	VLT® BACnet/IP MCA 125

[15] B-options *(character 31-32)*	
BX	No application option
BK	VLT® General Purpose MCB 101
BP	VLT® Relay Option MCB 105
B0	VLT® Analog I/O Option MCB 109
B2	VLT® PTC Thermistor Card MCB 112
B4	VLT® Sensor Input Card MCB 114
B5	VLT® Programmable I/O MCB 115

[16] C0-option *(character 33-34)*	
CX	No option

[17] Extended relay *(character 35)*	
X	No option
R	VLT® Extended Relay Card MCB 113

[18] Motion software *(character 35)*	
XX	No software option

[19] Control Power Back-up Input *(character 38-39)*	
DX	No DC input installed
D0	VLT® 24 V DC Supply Option MCB 107
D1	VLT® Real-time Clock Option MCB 117

Please beware that not all combinations are possible. Find help configuring your drive with the online configurator found under: ***driveconfig.danfoss.com***

Electrical data & dimensions – VLT® Low Harmonic Drive and VLT® Advanced Active Filters

[T4] 3 x 380 - 480 V AC – VLT® Low Harmonic Drive

Normal overload (110 % 1 min/10 min)									Enclosure size	
Type code	Output current				Typical shaft output power		Continuous input current	Estimated power loss	Protection rating [IEC/UL]	
	(3 x 380-440 V)		(3 x 441-480 V)						IP21	IP54
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 400 V	Hp @ 460 V	[A] @ 400 V	[W]	Type 1	Type 12
N160	315	347	302	332	160	250	304	8725	D1n	D1n
N200	395	435	361	397	200	300	381	9831	D2n	D2n
N250	480	528	443	487	250	350	463	11371	D2n	D2n
P315	600	660	540	594	315	450	590	14051	E9	E9
P355	658	724	590	649	355	500	647	15320	E9	E9
P400	745	820	678	746	400	600	733	17180	E9	E9
P450	800	880	730	803	450	600	787	18447	E9	E9

[T4] 3 x 380-480 V AC VLT® Advanced Active Filter

Normal overload (110 % 1 min/10min automatically regulated)											Enclosure size	
Type code	Corrected Current								Recommend-ed fuse and disconnect*	Estimated power loss	Protection rating [IEC/UL]	
	@ 400 V		@ 460 V		@ 480 V		@ 500 V				IP21	IP54
AAF006	Cont.	Int.	Cont.	Int.	Cont.	Int.	Cont.	Int.	[A]	[W]	Type 1	Type 12
A190	260	390	240	360	260	390	240	360	350	5000	D14	D14
A250	315	473	302	453	315	473	302	453	630	7000	E1	E1
A310	395	593	361	542	395	593	361	542	630	9000	E1	E1
A400	480	720	443	665	480	720	443	665	900	11100	E1	E1

** Built-in options for fuses and disconnect recommended*

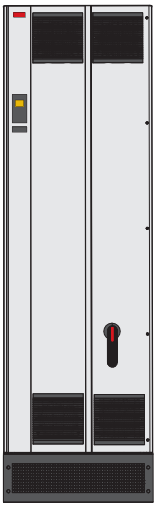
Dimensions – VLT® Low Harmonic Drive and VLT® Advanced Active Filter

		VLT® Low Harmonic Drive			VLT® Advanced Active Filter	
Enclosure size		D1n	D2n	E9	D14	E1
Protection rating [IEC/UL]		IP21 /Type 1 IP54 /Type 12			IP21 /Type 1 IP54 /Type 12	
[mm]	Height	1780	1780	2000.7	1780.0	2000.0
	Width	929.2	1024.2	1200.0	600.0	600.0
	Depth	418.4	418.4	538.0	418.4	538.0
[kg]	Weight	353.0	413.0	676.0	238.0	453.0
[in]	Height	70	70	78.8	70.0	78.7
	Width	36.6	40.3	47.2	23.6	23.6
	Depth	16.5	16.5	21.0	16.5	21.0
[lb]	Weight	777.0	910.0	1490.0	524.7	998.7

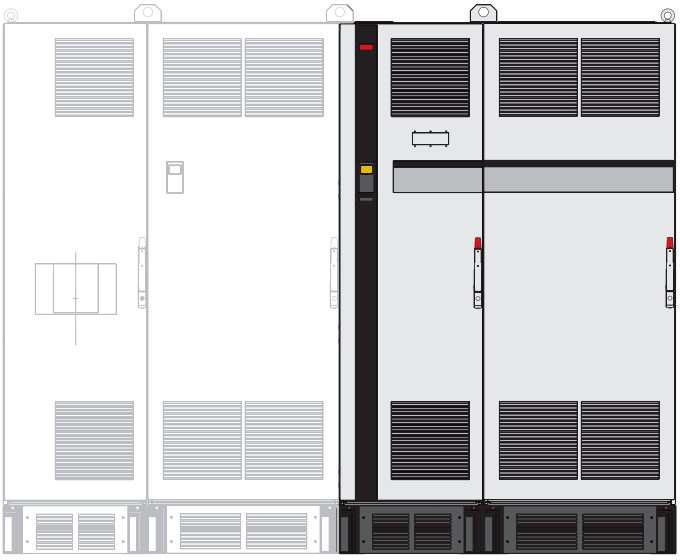
Specifications VLT® Advanced Active Filter

Filter type	3P/3W, Active Shunt Filter (TN, TT, IT)
Frequency	50 to 60 Hz, ± 5 %
Enclosures	IP 21 – NEMA 1, IP 54 – NEMA 12
Max. voltage pre-distortion	10 % 20 % with reduced performance
Operating temperature	0-40° C +5° C with reduced performance -10° C with reduced performance
Altitude	1000 m without derating 3000 m with reduced performance (5 %/1000 m)
EMC standards	IEC61000-6-2 IEC61000-6-4
Circuitry coating	Conformal coated – per ISA S71.04-1985, class G3
Languages	27 different
Harmonic compensation modes	Selective or overall (90 % RMS for harmonic reduction)
Harmonic compensation spectrum	2nd to 40th in overall mode, including triplens 5th, 7th, 11th, 13th, 17th, 19th, 23rd, 25th in selective mode

Individual harmonic current allocation in selective mode	I5: 63 %, I7: 45 %, I11: 29 %, I13: 25 %, I17: 18 %, I19: 16 %, I23: 14 %, I25: 13 %
Reactive current compensation	Yes, leading (capacitive) or lagging (inductive) to target power factor
Flicker reduction	Yes
Compensation priority	Programmable to harmonics or displacement power factor
Paralleling option	Up to 4 units of same power rating in master follower
Current Transformer Support (Customer supply and field mounting)	1 A and 5 A secondary with auto tuning Class 0.5 or better
Digital inputs /outputs	4 (2 programmable) Programmable PNP or NPN logic
Communication interface	RS485, USB1.1
Control type	Direct harmonic control (for faster response)
Response time	< 0,5 ms (including HW)
Harmonic settling time (5-95 %)	< 15 ms
Reactive settling time (5-95 %)	< 15 ms
Maximum overshoot	5 %
Switching frequency	Progressive control in the range of 3 – 18 kHz
Average switching frequency	3 – 4.5 kHz



VLT® Advanced Active Filter AAF 006



VLT® Low Harmonic Drive

Type code VLT® Advanced Active Filter

The different VLT® Active Filters can easily be configured acccording to customer request at **drives.danfoss.com**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	..	39
A	A	F	0	0	6	A	x	x	x	T	4	E	x	x	H	x	x	G	C	x	x	x	S	.	X

8-10:
190: 190 A correction current
250: 250 A correction current
310: 310 A correction current
400: 400 A correction current

13-15:
E21: IP 21/NEMA 1
E2M: IP 21/NEMA 1 w. mains shield
C2M: IP 21/NEMA 1 w. stainless steel back-channel and mains shield

E54: IP 54/NEMA 12
E5M: IP 54/NEMA 12 w. mains shield
C5M: IP 54/NEMA 12 w. stainless steel back-channel and mains shield

16-17:
HX: No RFI Filter
H4: RFI class A1

21:
X: No mains options
3: Disconnect & Fuse
7: Fuse

Electrical data for Enclosed Drive

[T4] 3 x 380-480 V AC – normal overload

Normal overload (110 % 1 min/10 min)									Enclosure size	
Type code	Output current				Typical shaft output power		Estimated power loss	Continuous input current	Protection rating	
	(3 x 380-440 V)		(3 x 441-480 V)						IP21	IP54
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 400 V	Hp @ 460 V	[W]	[A]	NEMA 1	NEMA 12
N110	212	233	190	209	110	150	2559	204	D9h	D9h
N132	260	286	240	264	132	200	2954	251	D9h	D9h
N160	315	347	302	332	160	250	3770	304	D9h	D9h
N200	395	435	361	397	200	300	4116	381	D10h	D10h
N250	480	528	443	487	250	350	5137	463	D10h	D10h
N315	588	647	535	588	315	450	6674	578	D10h	D10h
N355	658	724	590	649	355	500	6928	634	E5h	E5h
N400	745	820	678	746	400	600	8036	718	E5h	E5h
N450	800	880	730	803	450	600	8783	771	E5h	E5h
N500	880	968	780	858	500	650	9473	848	E6h	E6h
N560	990	1089	890	979	560	750	11102	954	E6h	E6h

[T7] 3 x 525-690 V AC – normal overload

Normal overload (110 % 1 min/10 min)									Enclosure size	
Type code	Output current				Typical shaft output power		Estimated power loss	Continuous input current	Protection rating	
	(3 x 525-550 V)		(3 x 551-690 V)						IP21	IP54
FC-102	Con. I_N	Inter. I_{MAX} (60 s)	Con. I_N	Inter. I_{MAX} (60 s)	kW @ 690 V	Hp @ 575 V	[W]	[A]	NEMA 1	NEMA 12
N110	137	151	131	144	110	125	1796	132	D9h	D9h
N132	162	178	155	171	132	150	2165	156	D9h	D9h
N160	201	221	192	211	160	200	2738	193	D9h	D9h
N200	253	278	242	266	200	250	3172	244	D10h	D10h
N250	303	333	290	319	250	300	3848	292	D10h	D10h
N315	360	396	344	378	315	350	4610	347	D10h	D10h
N355	418	460	400	440	400	400	5150	381	D10h	D10h
N400	470	517	450	495	450	450	6062	413	E5h	E5h
N500	523	575	500	550	500	500	6879	504	E5h	E5h
N560	596	656	570	627	560	600	8076	574	E5h	E5h
N630	630	693	630	693	630	650	9208	635	E5h	E5h
N710	763	839	730	803	710	750	10346	735	E6h	E6h
N800	889	978	850	935	800	950	12723	857	E6h	E6h