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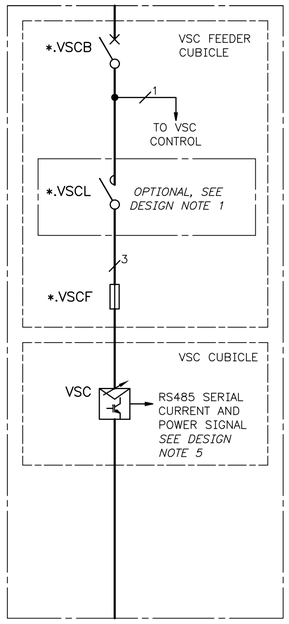
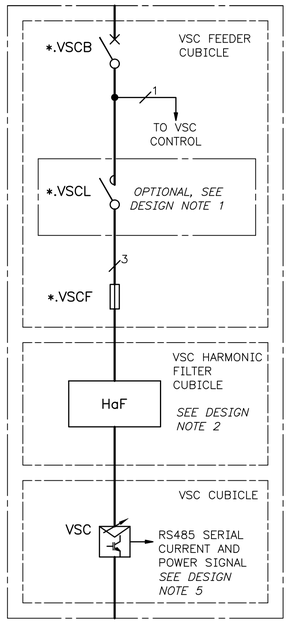
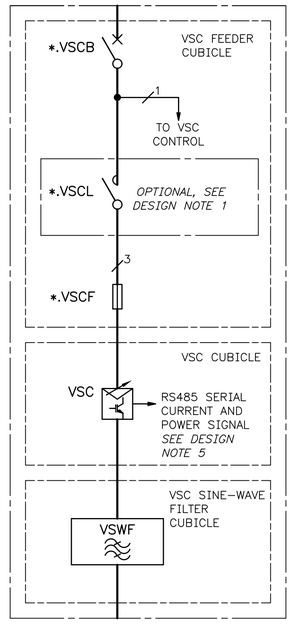


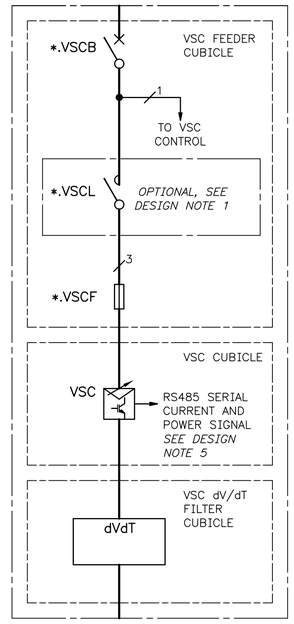
VSC ONLY
1.0A – 150.5A
(OUTDOOR ENVIRONMENT)



HARMONIC FILTER AND VSC
1.0A – 31.9A
(OUTDOOR ENVIRONMENT)
1.0A – 150.5A
(TEMPERATURE CONTROLLED ENVIRONMENT)



VSC AND SINE–WAVE FILTER
1.0A – 62.1A
(OUTDOOR ENVIRONMENT)
1.0A – 150.5A
(TEMPERATURE CONTROLLED ENVIRONMENT)



VSC AND dV/dT FILTER
12.9A – 150.5A
(OUTDOOR ENVIRONMENT)

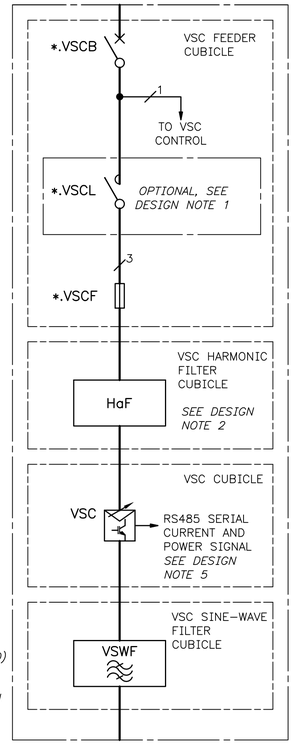
CODE SCHEDULE

dVdT	dV/dT FILTER
HaF	HARMONIC FILTER
VSC	VARIABLE SPEED CONTROLLER
VSCB	VARIABLE SPEED CONTROLLER CIRCUIT BREAKER
VSCF	VARIABLE SPEED CONTROLLER FUSE
VSCL	VARIABLE SPEED CONTROLLER LINE CONTACTOR
VSWF	VARIABLE SPEED CONTROLLER SINEWAVE FILTER

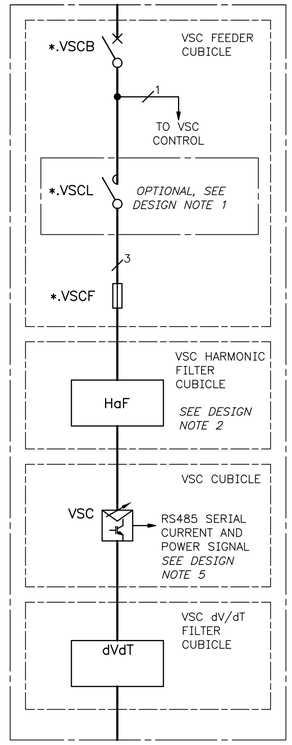
SERIAL COMMUNICATIONS
SEE INSTRUCTIONS FOR USE NOTE 6

PROTOCOL OPTIONS	CARD NUMBER	ORDERING CODE OPTION
PROFIBUS DP V1	MCA 101	A0
PROFINET	MCA 120	AL
MODBUS TCP	MCA 122	AQ

DESIGN NOTES
1. *INCLUDE VARIABLE SPEED CONTROLLER LINE CONTACTOR FOR APPLICATIONS REQUIRING MOTOR DECONTACTORS AND/OR EMERGENCY STOP PUSHBUTTONS, OTHERWISE LINE CONTACTOR NOT INSTALLED AND THE VSC TO REMAIN CONTINUOUSLY ENERGISED*
2. *A HARMONIC FILTER SHALL BE INSTALLED IF NECESSARY TO COMPLY WITH HARMONIC DISTORTION LIMITS SPECIFIED IN DS22, SECTION 7*
3. *THE USE OF A LINE REACTOR IS CONSIDERED A RARE PROJECT SPECIFIC REQUIREMENT AND DOES NOT FORM PART OF THIS STANDARD DESIGN*
4. *FOR ALL WATER PUMPING APPLICATIONS MOTOR THERMAL PROTECTION INTERNAL TO VSC VIA ELECTRONIC THERMAL RELAY (ETR) – TRIPPING CLASS 10*
5. *CURRENT AND POWER SIGNALS FROM VSC TO SCADA CAN BE OUTPUT IN THE FOLLOWING OPTIONAL FORMS :*
   – 4–20mA ANALOGUE SIGNALS OR
   – MODBUS RS–485 SERIAL DATA SIGNALS OR
   – ETHERNET SERIAL DATA SIGNALS (VIA OPTIONAL PROTOCOL COMMUNICATIONS CARD)
   THIS PROJECT SPECIFIC REQUIREMENT SHALL BE DETERMINED BY THE DESIGN ENGINEER IN ASSOCIATION WITH OPERATIONAL TECHNOLOGY
6. *IF A SERIAL COMMUNICATIONS CARD IS REQUIRED, THE SERIAL COMMUNICATION PROTOCOL IS PROJECT SPECIFIC AND EFFECTS THE VSC ORDERING CODE. THE AVAILABLE OPTIONS ARE SHOWN IN THE SERIAL COMMUNICATIONS TABLE. REPLACE THE ASTERISKS IN THE ORDERING CODE AT POSITIONS 29 AND 30 TO SUIT THE REQUIRED PROTOCOL CARD*



HARMONIC FILTER, VSC AND SINE–WAVE FILTER
1.0A – 31.9A
(OUTDOOR ENVIRONMENT)
12.9A – 150.5A
(TEMPERATURE CONTROLLED ENVIRONMENT)



HARMONIC FILTER, VSC AND dV/dT FILTER
12.9A – 31.9A
(OUTDOOR ENVIRONMENT)
12.9A – 150.5A
(TEMPERATURE CONTROLLED ENVIRONMENT)

POWER EQUIPMENT SCHEDULE

CODE	MOTOR FULL LOAD CURRENT	SPECIFICATION
VSCB	1.0A – 31.9A	SCHNEIDER ELECTRIC, COMPACT NSX100B, : 100A WITH MICROLOGIC 2.2, 40A TRIP UNIT
	32.0A – 62.1A	SCHNEIDER ELECTRIC, COMPACT NSX100B, : 100A WITH MICROLOGIC 2.2, 100A TRIP UNIT
	62.2A – 76.5A	SCHNEIDER ELECTRIC, COMPACT NSX160B, : 160A, WITH MICROLOGIC 2.2, 100A TRIP UNIT
	76.6A – 90.1A	SCHNEIDER ELECTRIC, COMPACT NSX160B, : 160A, WITH MICROLOGIC 2.2, 160A TRIP UNIT
	90.2A – 125.0A	SCHNEIDER ELECTRIC, COMPACT NSX250B, : 250A, WITH MICROLOGIC 2.2, 160A TRIP UNIT
	125.1A – 150.5A	SCHNEIDER ELECTRIC, COMPACT NSX250B, : 250A, WITH MICROLOGIC 2.2, 250A TRIP UNIT
VSCF	1.0 – 5.8A	BUSSMANN, CM32FC : 32A WITH GEC, NIT10 : 10A FUSE LINK
	5.8 – 12.8A	BUSSMANN, CM32FC : 32A WITH GEC, NIT16 : 16A FUSE LINK
	12.9 – 31.9A	BUSSMANN, CM63FC : 63A WITH GEC, TIS50 : 50A FUSE LINK
	32.0 – 37.4A	BUSSMANN, CM63FC : 63A WITH GEC, TIS63 : 63A FUSE LINK
	37.5 – 51.9A	BUSSMANN, CM100FC : 100A WITH GEC, TIS80 : 80A FUSE LINK
	52.0 – 62.1A	BUSSMANN, CM100FC : 100A WITH GEC, TIS100 : 100A FUSE LINK
	62.2 – 76.5A	SIBA, 21 189 08 : URB–U NH00–DIN80 1000V WITH SIBA, 20 282 20–160 : 160A, CLASS aR, NH000–DIN80
	76.6 – 90.1A	SIBA, 21 189 08 : URB–U NH00–DIN80 1000V SIBA, 20 282 20–200 : 200A, CLASS aR, NH000–DIN80
	90.2A – 150.5A	SIBA, 21 189 08, NH00, DIN80, : 400A, 1000V SIBA, 20 282 20–250 : 250A, CLASS aR, NH000–DIN80
HaF	1.0 – 8.0A	DANFOSS, 130B1229 (AHF005) / 130B1027 (AHF010)
	8.1 – 12.8A	DANFOSS, 130B1231 (AHF005) / 130B1058 (AHF010)
	12.9 – 20.4A	DANFOSS, 130B1232 (AHF005) / 130B1059 (AHF010)
	20.5 – 27.2A	DANFOSS, 130B1233 (AHF005) / 130B1089 (AHF010)
	27.3 – 31.9A	DANFOSS, 130B1238 (AHF005) / 130B1094 (AHF010)
	32.0 – 37.4A *(FUTURE)*	DANFOSS, 130B1239 (AHF005) / 130B1111 (AHF010)
	37.5 – 51.9A *(FUTURE)*	DANFOSS, 130B1241 (AHF005) / 130B1180 (AHF010)
	52.0 – 62.1A *(FUTURE)*	DANFOSS, 130B1247 (AHF005) / 130B1201 (AHF010)
	62.2 – 76.5A *(FUTURE)*	DANFOSS, 130B1248 (AHF005) / 130B1204 (AHF010)
	76.6 – 90.1A *(FUTURE)*	DANFOSS, 130B1249 (AHF005) / 130B1207 (AHF010)
	90.2 – 150.5A *(FUTURE)*	DANFOSS, 130B1250 (AHF005) / 130B1213 (AHF010)
VSC	0 – 1.0A	DANFOSS, FC–202PK37T4E66H1XGCXXXSXXXX**BXCXRXXDX
	1.1 – 1.4A	DANFOSS, FC–202PK55T4E66H1XGCXXXSXXXX**BXCXRXXDX
	1.5 – 1.9A	DANFOSS, FC–202PK75T4E66H1XGCXXXSXXXX**BXCXRXXDX
	2.0 – 2.4A	DANFOSS, FC–202P1K1T4E66H1XGCXXXSXXXX**BXCXRXXDX
	2.5 – 3.3A	DANFOSS, FC–202P1K5T4E66H1XGCXXXSXXXX**BXCXRXXDX
	3.4 – 4.5A	DANFOSS, FC–202P2K2T4E66H1XGCXXXSXXXX**BXCXRXXDX
	4.6 – 5.8A	DANFOSS, FC–202P3K0T4E66H1XGCXXXSXXXX**BXCXRXXDX
	5.9 – 8.0A	DANFOSS, FC–202P4K0T4E66H1XGCXXXSXXXX**BXCXRXXDX
SEE DESIGN NOTE 6	8.1 – 10.4A	DANFOSS, FC–202P5K5T4E66H1XGCXXXSXXXX**BXCXRXXDX
	10.5 – 12.8A	DANFOSS, FC–202P7K5T4E66H1XGCXXXSXXXX**BXCXRXXDX
	12.9 – 20.4A	DANFOSS, FC–202P11KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	20.5 – 27.2A	DANFOSS, FC–202P15KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	27.3 – 31.9A	DANFOSS, FC–202P22KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	32.0 – 37.4A	DANFOSS, FC–202P30KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	37.5 – 51.9A	DANFOSS, FC–202P37KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	52.0 – 62.1A	DANFOSS, FC–202P45KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	62.2 – 76.5A	DANFOSS, FC–202P55KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	76.6 – 90.1A	DANFOSS, FC–202P75KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	90.2 – 125A	DANFOSS, FC–202P90KT4E66H1XGCXXXSXXXX**BXCXRXXDX
	125.1 – 150.5A	DANFOSS, FC–202P90KT4E66H1XGCXXXSXXXX**BXCXRXXDX
VSWF	1.0 – 2.4A	DANFOSS, 130B2439
	2.5 – 3.3A	DANFOSS, 130B2441
	3.4 – 5.8A	DANFOSS, 130B2443
	5.9 – 8.0A	DANFOSS, 130B2444
	8.1 – 12.8A	DANFOSS, 130B2446
	12.9 – 20.4A	DANFOSS, 130B2447
	20.5 – 31.9A	DANFOSS, 130B2448
	32.0 – 37.4A	DANFOSS, 130B2307
	37.5 – 51.9A	DANFOSS, 130B2308
	52.0 – 62.1A	DANFOSS, 130B2309
	62.2 – 76.5A *(FUTURE)*	DANFOSS, 130B3181
	76.6 – 90.1A *(FUTURE)*	DANFOSS, 130B3181
	90.2 – 125A *(FUTURE)*	DANFOSS, 130B3183
	125.1 – 150.5A *(FUTURE)*	DANFOSS, 130B3183
dV/dT	12.9 – 37.4A	DANFOSS, 130B2836
	37.5 – 76.5A	DANFOSS, 130B2839
	76.6 – 90.1A	DANFOSS, 130B2842
	90.2 – 150.5A	DANFOSS, 130B2845

VSC DESIGN CRITERIA
1. *MAXIMUM OUTPUT CURRENT OF VSC IN AN OUTDOOR MK 8 VSC VENTILATED CUBICLE IS LIMITED TO MAXIMUM 125A AT MAXIMUM AMBIENT TEMPERATURE OF 50°C*
2. *MAXIMUM OUTPUT CURRENT OF VSC IN AN OUTDOOR MK 8 VSC VENTILATED CUBICLE IS LIMITED TO MAXIMUM 150.5A AT MAXIMUM AMBIENT TEMPERATURE 45°C*
3. *MAXIMUM OUTPUT CURRENT OF VSC IN THE RANGE 150.6 TO 263A REQUIRES A TEMPERATURE CONTROLLED ENVIRONMENT. (PLANNED FUTURE DESIGN)*

ISSUE	DATE	GRID	REVISION	DRN	REC	APPD

DESIGN SURVEY NONE	VERTICAL DATUM NONE	DES CALC S GILMOUR	NORTH POINT
	COORDINATE SYS NONE	DES CHD T LIU	
ASCON SURVEY NONE	DES REF	DRN SA MEMORY	
		Q.C. CHD P HARVEY	

SUBMITTED 16/06/2023 SA MEMORY (SIGNED) SENIOR TECHNICAL ADVISOR – ELECT

RECOMMENDED 16/06/2023 S GILMOUR (SIGNED) SENIOR ENGINEER – ELECTRICAL

APPROVED 16/06/2023 T LIU (SIGNED) PRINCIPAL ENGINEER – ELECTRICAL

ENGINEERING

WATER CORPORATION

ELECTRICAL STANDARD SWITCHBOARD DESIGNS
SMALL PUMP STATIONS
PRIMARY DESIGN – POWER DIAGRAM TEMPLATE OPTIONS
MOTOR STARTERS – WATER – PART 3 (VARIABLE SPEED)

FILE
PROJECT
PLAN MN01–13–1.3
CAD
ISSUE A
ORIGINAL SHEET SIZE A1
MF

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