APPENDIX A - DESIGN DATA.

The following information is intended to assist the designer performing circuit calculations and to offer guidance with the selection of suitable Modular Wiring.

ALL Tables in Appendices A1, A2 and A3 are based on an ambient operating temperature of 30°c.

For data applicable to FACC cables, please consult our Engineering Division.

All values are for stranded conductors unless noted otherwise.

The individual cores of Home Run and extender cables must be de-rated in accordance with Appendix 4 of BS7671: 1992 Methods 3 & 4. Where applicable, factors for grouping, thermal insulation and ambient temperature must be applied to correct the tabulated value of current carrying capacity.

i.e:

$$It \geq \frac{In}{CaCgCi}$$

It should be noted that the above formula is used where simultaneous overload conditions apply.

APPENDIX A1 - CURRENT CARRYING CAPACITY.

Table A1·01: CURRENT CARRYING CAPACITY FOR ARMOURED HOME RUN CABLES - METHODS 11 & 13 (BS7671: 1992) ~ "ON TRAYS & FREE AIR" [SEE NOTE 1]

CSA		SINGLE PHASE	THREE PHASE
mm²	AWG	A	A
3·33	12	33	29
5·27	10	44	40

Table A1·02: CURRENT CARRYING CAPACITY FOR ARMOURED EXTENDER CABLES - METHODS 11 & 13 (BS7671: 1992) ~ "ON TRAYS & FREE AIR" [SEE NOTE 2]

CSA		SINGLE PHASE	THREE PHASE
mm²	AWG	A	A
3·33	12	33 *	29 *

* Denotes SOLID conductors

APPENDIX A1 - CURRENT CARRYING CAPACITY.

Table A1·03: CURRENT CARRYING CAPACITY FOR UN-ARMOURED HOME RUN CABLES - METHODS 11 & 13 (BS7671: 1992) ~ "ON TRAYS & FREE AIR" [SEE NOTE 1]

CSA		SINGLE PHASE	THREE PHASE
mm²	AWG	A	A
2·50	-	20	20

Table A1·04: CURRENT CARRYING CAPACITY FOR UN-ARMOURED EXTENDER CABLES - METHODS 11 & 13 (BS7671: 1992) ~ "ON TRAS & FREE AIR" [SEE NOTE 3]

CSA		SINGLE PHASE	THREE PHASE
mm²	AWG	A	A
1·00	-	10 *	10 *
1·50	-	16 *	16 *
2·50	-	25 *	20 *
1·50	-	16	16
2·50	-	25	20
4·00	-	32	25

* Denotes SOLID conductors

APPENDIX A1 - CURRENT CARRYING CAPACITY.

Table A1·05: CURRENT CARRYING CAPACITY FOR MC CABLE - METHODS 11 & 13 (BS7671: 1992) ~ "ON TRAYS & FREE AIR" [SEE NOTE 4]

CSA		SINGLE PHASE	THREE PHASE
mm²	AWG	A	A
1·50	-	16·5 *	13·5 *
2·50	-	23 *	18·5 *
1·50	-	16·5	13·5
2·50	-	23	18·5
4·00	-	31	25
6·00	-	40	32
10·00	-	55	44
16·00	-	73	58
25·00	-	97	76
35·00	-	120	94

* Denotes SOLID conductors

APPENDIX A1 - CURRENT CARRYING CAPACITY.

Table A1·06: CURRENT CARRYING CAPACITY FOR MC CABLE - METHOD 1 (BS7671: 1992) ~ "FIXED DIRECT" [SEE NOTE 4]

CSA		SINGLE PHASE	THREE PHASE
mm²	AWG	A	A
1·50	-	15·5 *	13·5 *
2·50	-	22 *	18·5 *
1·50	-	15·5	13·5
2·50	-	22	18·5
4·00	-	29	25
6·00	-	38	32
10·00	-	53	43
16·00	-	72	58
25·00	-	96	76
35·00	-	119	93

* Denotes SOLID conductors

APPENDIX A2 - VOTLAGE DROP.

Table A2·01: SINGLE PHASE VOLTAGE DROP FOR ARMOURED HOME RUN & EXTENDER CABLES - METHOD 1 "FIXED DIRECT" AND METHODS 11 & 13 "ON TRAYS & FREE AIR" ~ (BS7671: 1992)

CSA mm²	CSA AWG	HOME RUN CABLE mV/A/m	EXTENDER CABLE mV/A/m
3·33	12	13·28	13·28 *
5·27	10	8·36	-

* Denotes SOLID conductors

Table A2·02: THREE PHASE VOLTAGE DROP FOR ARMOURED HOME RUN & EXTENDER CABLES - METHOD 1 "FIXED DIRECT" AND METHODS 11 & 13 "ON TRAYS & FREE AIR" ~ (BS7671: 1992)

CSA mm²	CSA AWG	HOME RUN CABLE mV/A/m	EXTENDER CABLE mV/A/m
3·33	12	11·5	11·5 *
5·27	10	7·24	-

* Denotes SOLID conductors

APPENDIX A2 - VOTLAGE DROP.

Table A2·03: SINGLE PHASE VOLTAGE DROP FOR UN-ARMOURED HOME RUN & EXTENDER CABLES - METHOD 1 "FIXED DIRECT" AND METHODS 11 & 13 "ON TRAYS & FREE AIR" ~ (BS7671: 1992)

CSA mm²	AWG	HOME RUN CABLE mV/A/m	EXTENDER CABLE mV/A/m
1·00	-	-	46 *
1·50	-	-	32 *
2·50	-	-	19 *
1·50	-	-	32
2·50	-	18	19
4·00	-	-	12

* Denotes SOLID conductors

Table A2·04: THREE PHASE VOLTAGE DROP FOR UN-ARMOURED HOME RUN & EXTENDER CABLES - METHOD 1 "FIXED DIRECT" AND METHODS 11 & 13 "ON TRAYS & FREE AIR" ~ (BS7671: 1992)

CSA mm²	AWG	HOME RUN CABLE mV/A/m	EXTENDER CABLE mV/A/m
1·00	-	-	40 *
1·50	-	-	27 *
2·50	-	-	16 *
1·50	-	-	27
2·50	-	15	16
4·00	-	-	10

* Denotes SOLID conductors

APPENDIX A2 - VOTLAGE DROP.

Table A2·05: VOTLAGE DROP VALUES FOR MC CABLE - METHOD1 "FIXED DIRECT" AND METHODS 11 & 13 "ON TRAYS & FREE AIR" ~ (BS7671: 1992)

CSA	SINGLE PHASE mV/A/m			THREE PHASE MV/A/m		
mm²	R	X	Z	R	X	Z
1·5 *	29	-	29	29	-	29
2·5 *	18	-	18	18	-	18
1·5	29	-	29	29	-	29
2·5	18	-	18	18	-	18
4·0	11	-	11	11	-	11
6·0	7·3	-	7·3	7·3	-	7·3
10·0	4·4	-	4·4	4·4	-	4·4
16·0	2·8	-	2·8	2·8	-	2·8
25·0	1·75	0·200	1·75	1·75	0·200	1·75
35·0	1·25	0·195	1·25	1·25	0·195	1·25

* Denotes SOLID conductors

APPENDIX A3 - RESISTANCE & IMPEDANCE.

Table A3·01 RESISTANCE & IMPEDANCE VALUES FOR ARMOURED HOME RUN CABLES

CSA		COPPER CONDUCTORS	LOOP IMPEDANCE
mm²	AWG	R [Ω/Km @ 20°c]	[Ω/Km SEE NOTE 5]
3·33	12	5·29	15·03
5·27	10	3·31	9·41

Table A3·02 RESISTANCE & IMPEDANCE VALUES FOR ARMOURED EXTENDER CABLES

CSA		COPPER CONDUCTORS	LOOP IMPEDANCE
mm²	AWG	R [Ω/Km @ 20°c]	[Ω/Km SEE NOTE 5]
3·33	12	5·29 *	15·03 *

* Denotes SOLID conductors

APPENDIX A3 - RESISTANCE & IMPEDANCE.

Table A3·03 RESISTANCE & IMPEDANCE VALUES FOR UN-ARMOURED HOME RUN CABLES

CSA		COPPER CONDUCTORS	LOOP IMPEDANCE
mm²	AWG	R [Ω/Km @ 20°c]	[Ω/Km SEE NOTE 5]
2·50	-	7·41	20·46
4·00†	-	4·61	12·73

† Earth conductor only.

Table A3·04 RESISTANCE & IMPEDANCE VALUES FOR UN-ARMOURED EXTENDER CABLES

CSA	COPPER CONDUCTORS	LOOP IMPEDANCE
mm²	R [Ω/Km @ 20°c]	[Ω/Km]
1·00	18·10 *	49·96 *
1·50	12·10 *	33·40 *
2·50	7·41 *	20·46 *
1·50	12·10	33·40
2·50	7·41	20·46
4·00	4·61	12·73

* Denotes SOLID conductors

APPENDIX A3 - RESISTANCE & IMPEDANCE.

Table A3·05 RESISTANCE & IMPEDANCE VALUES FOR MC CABLE

CSA	COPPER CONDUCTORS	LOOP IMPEDANCE
mm²	R [Ω/Km @ 20°c]	[Ω/Km SEE NOTE 6]
1·50	12·10 *	33·40 *
2·50	7·41 *	20·46 *
1·50	12·10	33·40
2·50	7·41	20·46
4·00	4·61	12·73
6·00	3·08	8·51
10·00	1·83	5·06
16·00	0·727	2·01
25·00	0·524	1·45

* Denotes SOLID conductors

APPENDIX B - DIMENSIONS & WEIGHTS.

Table B·01 DIMENSIONS & WEIGHTS FOR ARMOURED HOME RUN CABLES

CSA	EXTERNAL DIAMETER mm			APPROXIMATE WEIGHT Kg/Km		
mm²	18 Core	24 Core	27 Core	18 Core	24 Core	27 Core
3·33	21·1	TBA	27·8	1100	TBA	1600
5·27	24·9		32·7	1590		2420

Table B·02 DIMENSIONS & WEIGHTS FOR ARMOURED EXTENDER CABLES

CSA	EXTERNAL DIAMETER mm				APPROXIMATE WEIGHT Kg/Km			
mm²	3 Core	4 Core	5 Core	Network	3 Core	4 Core	5 Core	Network
3·33 *	13·5	14·4	15·7	15·7	380	440	500	500

* Denotes SOLID conductors

APPENDIX B – DIMENSIONS & WEIGHTS.

Table B·03 DIMENSIONS & WEIGHTS FOR UN-ARMOURED HOME RUN CABLES

CSA	EXTERNAL DIAMETER mm		APPROXIMATE WEIGHT Kg/Km	
mm²	21 Core		21 Core	
2·50	TO BE ADVISED			

Table B·04 DIMENSIONS & WEIGHTS FOR UN-ARMOURED EXTENDER CABLES

CSA	EXTERNAL DIAMETER mm			APPROXIMATE WEIGHT Kg/Km		
mm²	3 CORE	4 CORE	5 CORE	3 CORE	4 CORE	5 CORE
1·0 *						
1·5 *						
2·5 *						
1·5	TO BE ADVISED					
2·5						
4·0						

* Denotes SOLID conductors

APPENDIX B – DIMENSIONS & WEIGHTS.

Table B·05 DIMENSIONS & WEIGHTS FOR MC CABLES

CSA	EXTERNAL DIAMETER Mm			APPROXIMATE WEIGHT Kg/Km		
mm²	3 Core	4 Core	5 Core	3 Core	4 Core	5 Core
1·5 *	11·4	11.5	11·7	195	215	235
2·5 *	11·5	11.9	12·8	230	270	310
1·5	11·5	11.5	12·3	200	230	255
2·5	11·8	12.6	13·5	240	300	360
4·0	12·8	13.8	14·8	380	415	485
6·0	14·8	16.0	17·3	465	600	660
10·0	17·5	19.2	21·0	625	775	930
16·0	20·2	21.4	23·3	860	1060	1270
25·0	24·2	26.1	28·0	1210	1530	1850
35·0	26·2	29.2	32·1	1550	2200	2570

- Denotes SOLID conductors

APPENDIX C - MINIMUM BENDING RADII.

The minimum bending radii for ALL Modular Wiring Cables is 7 times the diameter.

NOTES.

1. Armoured Home Run cables are rated at an operating temperature of 90ºc.
2. Armoured Extender cables are rated at an operating temperature of 90ºc.
3. Un-Armoured Extender cables are rated at an operating temperature of 70ºc.
4. MC cables are rated at an operating temperature of 70ºc.
5. These Loop impedance figures are based upon the phase conductor resistance @ 125°c, the CPC resistance @ 125°c, having one conductor for Phase & CPC. The resistance of the cable armour has a negligible effect on the overall impedance, and is therefore ignored.
6. These Loop impedance figures are based upon the phase conductor resistance @ 115°c, the CPC resistance @ 115°c, having one conductor for Phase & CPC. The resistance of the cable armour has a negligible effect on the overall impedance, and is therefore ignored.
7. When anchored to the building fabric at fixing centres up to 1000mm, these fixings will facilitate an installation with no deflection.
8. Modular Wiring Systems Europe Limited has a policy of continuous development and we reserve the right to alter the technical specification of our projects without prior notice.