FUSECO

Fuses

Protection Relays

Power Factor Correction

Power Quality

Current Transformers

Test Equipment

2021/2022

COMPETITIVE PRICES

EXPERTISE & TECHNICAL SUPPORT

LARGEST STOCK RANGE

FAST DELIVERY AUSTRALIA WIDE

24 HOUR CUSTOMER SERVICE

MINIMUM ORDER VALUE:

Just $20.00 (excluding GST & freight), for account customers

24 HOUR, 7 DAYS A WEEK SERVICE:

Call **0411 104 363** if you need to source a fuse after working hours or on the weekend due to a breakdown situation, Fuseco can help!

FREIGHT OPTIONS

Fuse Products

- For all orders over $100 (excl. GST & freight), freight is FIS (Free into Store)
- For all orders under $100 (excl. GST & freight) a freight charge of $25.00 + GST is applicable
- Additional fees may apply for deliveries to the Northern Territory & remote areas.

All Other Products

- Freight charges POA (Price on Application)
- FOT (Customer nominates own carrier and accepts all charges).

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Sunshine Beach QLD
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FUSES

PROTECTION RELAYS

POWER FACTOR CORRECTION

POWER QUALITY

CURRENT TRANSFORMERS

TEST EQUIPMENT

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Fuses? FUSECO

FUSECO

Fuses

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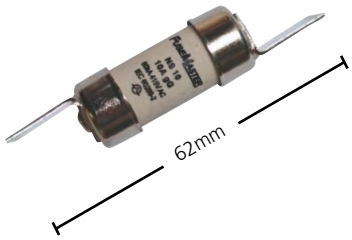
Clip-In Offset Tag

NS
415V

FuseMaster



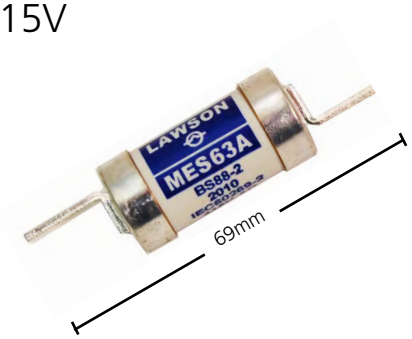
Type gG for cable and line protection

FUSECO PART NUMBER	BUSSMANN PART NUMBER	MEM PART NUMBER	AMP	VOLTAGE	PACK SIZE
NS2	NSD 2	2SN2	2A	415V	20
NS4	NSD 4	4SN2	4A	415V	20
NS6	NSD 6	6SN2	6A	415V	20
NS8	NSD 8	8SN2	8A	415V	20
NS10	NSD 10	10SN2	10A	415V	20
NS16	NSD 16	16SN2	16A	415V	20
NS20	NSD 20	20SN2	20A	415V	20
NS25	NSD 25	25SN2	25A	415V	20
NS32	NSD 32	32SN2	32A	415V	20
NS10M16	–	–	10M16A	415V	10
NS16M20	–	–	16M20A	415V	10
NS20M25	NSD 20M25	20SN2M25	20M25A	415V	20
NS20M32	NSD 20M32	20SN2M32	20M32A	415V	20
NS25M32	–	–	25M32A	415V	10
NSD32M36	NSD32M36	–	32M36A	415V	10
NS32M40	NSD 32M40	32SN2M40	32M40A	415V	20
NS32M50	NSD 32M50	32SN2M50	32M50A	415V	20
NS32M63	NSD 32M63	32SN2M63	32M63A	415V	20

FUSE HOLDERS TO SUIT **Refer to page 9**

ESD
MES
550V
415V

LAWSON
Bussmann



ESD2	ESD 2	–	2A	550V	20
ESD4	ESD 4	–	4A	550V	20
ESD6	ESD 6	–	6A	550V	20
MES10	ESD 10	–	10A	415V	20
MES16	ESD 16	16SP	16A	415V	20
MES20	ESD 20	20SP	20A	415V	20
MES25	ESD 25	25SP	25A	415V	20
MES32	ESD 32	32SP	32A	415V	20
MES40	ESD 40	40SP	40A	415V	20
MES50	ESD 50	50SP	50A	415V	20
MES63	ESD 63	60SP	63A	415V	20
ESD63M80	ESD63M80	–	63M80A	415V	10
ESD63M100	ESD63M100	–	63M100A	415V	10

FUSE HOLDERS TO SUIT **Refer to page 9**

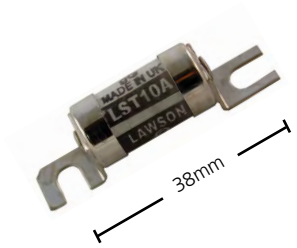
SS
240V

LAWSON

SS2	SSD 2	–	2A	240V	10
SS4	SSD 4	–	4A	240V	10
SS6	SSD 6	–	6A	240V	10
SS10	SSD 10	–	10A	240V	10
SS16	SSD 16	–	16A	240V	10
SS20	SSD 20	–	20A	240V	10
SS25	SSD 25	–	25A	240V	10
SS32	SSD 32	–	32A	240V	10

Bolt-In Offset Tag

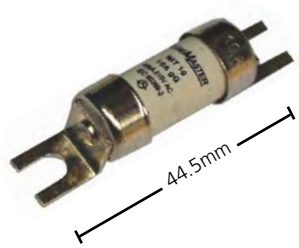
LST
240V



Type gG for cable and line protection

FUSECO PART NUMBER	BUSSMANN PART NUMBER	MEM PART NUMBER	AMP	VOLTAGE	PACK SIZE
LST2	STD 2	2LS	2A	240V	10
LST4	STD 4	4LS	4A	240V	10
LST6	STD 6	6LS	6A	240V	10
LST10	STD 10	10LS	10A	240V	10
LST16	STD 16	16LS	16A	240V	10
LST20	STD 20	20LS	20A	240V	10
LST25	STD 25	25LS	25A	240V	10
LST32	STD 32	–	32A	240V	10

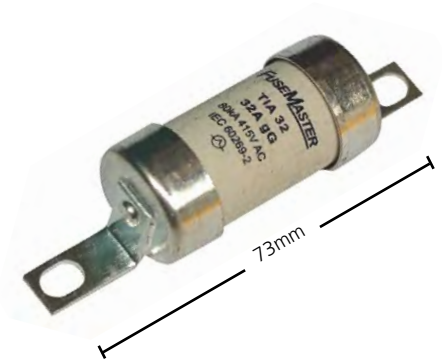
NIT
415V



NIT2	NITD 2	2SA2	2A	415V	20
NIT4	NITD 4	4SA2	4A	415V	20
NIT6	NITD 6	6SA2	6A	415V	20
NIT10	NITD 10	10SA2	10A	415V	20
NIT16	NITD 16	16SA2	16A	415V	20
NIT20	NITD 20	20SA2	20A	415V	20
NIT25	NITD 25	25SA2	25A	415V	20
NIT32	NITD 32	32SA2	32A	415V	20
NIT20M25	NITD 20M25	20SA2M25	20M25A	415V	20
NIT20M32	NITD 20M32	20SA2M32	20M32A	415V	20
NIT32M40	–	32SA2M40	32M40A	415V	20
NIT32M50	–	32SA2M50	32M50A	415V	20
NIT32M63	–	32SA2M63	32M63A	415V	20

FUSE HOLDERS TO SUIT **Refer to page 9**

TIA
TIS
415V



TIA2	AAO 2	2SB3	2A	415V	10
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TIA6	AAO 6	6SB3	6A	415V	10
TIA10	AAO 10	10SB3	10A	415V	10
TIA16	AAO 16	16SB3	16A	415V	10
TIA20	AAO 20	20SB3	20A	415V	10
TIA25	AAO 25	25SB3	25A	415V	10
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TIA32M40	AAO 32M40	32SB3M40	32M40A	415V	10
TIA32M50	AAO 32M50	32SB3M50	32M50A	415V	10
TIA32M63	AAO 32M63	32SB3M63	32M63A	415V	10
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TIS63M100	BAO63M100	63SB4M100	63M100A	415V	10
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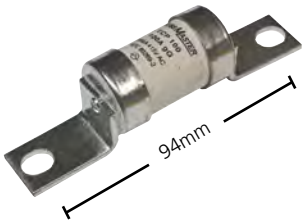
FUSE HOLDERS TO SUIT **Refer to page 9**

Bolt-In Offset Tag

TCP
TFP
415V

FuseMaster



Type gG for cable and line protection

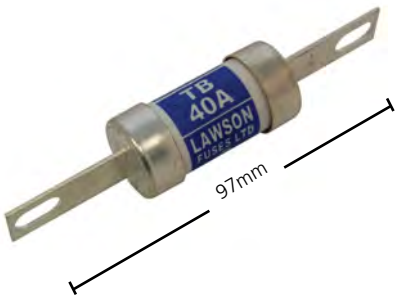
FUSECO PART NUMBER	BUSSMANN PART NUMBER	MEM PART NUMBER	AMP	VOLTAGE	PACK SIZE
TCP20	–	–	20A	415V	10
TCP25	–	–	25A	415V	5
TCP32	CEO 32	–	32A	415V	10
TCP40	CEO 40	–	40A	415V	10
TCP50	CEO 50	–	50A	415V	10
TCP63	CEO 63	–	63A	415V	10
TCP80	CEO 80	80SD5	80A	415V	10
TCP100	CEO 100	100SD5	100A	415V	10
TCP100M125	CEO 100M125	100SD5M125	100M125A	415V	10
TCP100M160	CEO 100M160	100SD5M160	100M160A	415V	10
TCP100M200	CEO 100M200	100SD5M200	100M200A	415V	10
TFP125	DEO 125	125SD6	125A	415V	10
TFP160	DEO 160	160SD6	160A	415V	10
TFP200	DEO 200	200SD6	200A	415V	10
TFP200M250	DEO 200M250	200SD6M250	200M250A	415V	10
TFP200M315	DEO 200M315	200SD6M315	200M315A	415V	10

FUSE HOLDERS TO SUIT **Refer to page 9**

Bolt-In Centre Tag

TB
415V

LAWSON



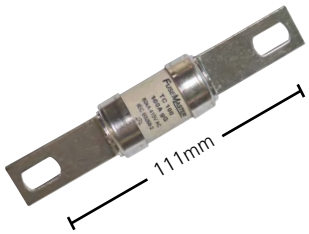
Type gG for cable and line protection

FUSECO PART NUMBER	BUSSMANN PART NUMBER	MEM PART NUMBER	AMP	VOLTAGE	PACK SIZE
TB2	AC 2	2SE3	2A	415V	10
TB4	AC 4	4SE3	4A	415V	10
TB6	AC 6	6SE3	6A	415V	10
TB10	AC 10	10SE3	10A	415V	10
TB16	AC 16	16SE3	16A	415V	10
TB20	AC 20	20SE3	20A	415V	10
TB25	AC 25	25SE3	25A	415V	10
TB32	AC 32	32SE3	32A	415V	10
TB35	–	–	35A	415V	10
TB40	BC 40	40SE4	40A	415V	10
TB50	BC 50	50SE4	50A	415V	10
TB63	BC 63	63SE4	63A	415V	10
TB63M80	BC 63M80	–	63M80A	415V	10
TB63M100	BC 63M100	–	63M100A	415V	10

Bolt-In Centre Tag

TBC
TC
TF
TKF
TMF
415V

FuseMaster
LAWSON



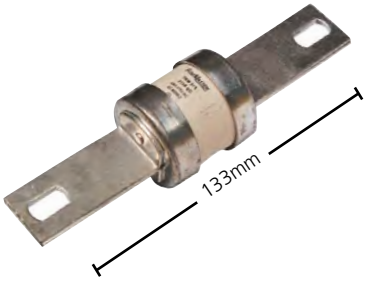
Type gG for cable and line protection

FUSECO PART NUMBER	BUSSMANN PART NUMBER	MEM PART NUMBER	AMP	VOLTAGE	PACK SIZE
TBC2	AD 2	2SF3	2A	415V	10
TBC4	AD 4	4SF3	4A	415V	10
TBC6	AD 6	6SF3	6A	415V	10
TBC10	AD 10	10SF3	10A	415V	10
TBC16	AD 16	16SF3	16A	415V	10
TBC20	AD 20	20SF3	20A	415V	10
TBC25	AD 25	25SF3	25A	415V	10
TBC32	AD 32	32SF3	32A	415V	10
TBC35	–	–	35A	415V	10
TBC40	BD 40	40SF4	40A	415V	10
TBC50	BD 50	50SF4	50A	415V	10
TBC63	BD 63	63SF4	63A	415V	10
TBC63M80	–	–	63M80A	415V	10
TBC63M100	–	–	63M100A	415V	10
TC80	CD 80	80SF5	80A	415V	10
TC100	CD 100	100SF5	100A	415V	10
TC100M125	CD 100M125	100SF5M125	100M125A	415V	10
TC100M160	CD 100M160	100SF5M160	100M160A	415V	10
TC100M200	CD 100M200	100SF5M200	100M200A	415V	10
TF125	DD 125	125SF6	125A	415V	10
TF160	DD 160	160SF6	160A	415V	10
TF200	DD 200	200SF6	200A	415V	10
TF200M250	DD 200M250	200SF6M250	200M250A	415V	10
TF200M315	DD 200M315	200SF6M315	200M315A	415V	10
TKF250	ED 250	250SF7	250A	415V	3
TKF315	ED 315	315SF7	315A	415V	3
TKF315M355	–	–	315M355A	415V	3
TKF315M400	ED 315M400	315SF7M400	315M400A	415V	3
TMF355	ED 355	355SF8	355A	415V	3
TMF400	ED 400	400SF8	400A	415V	3
TMF400M450	–	–	400M450A	415V	3
TMF400M500	ED 400M500	400SF8M500	400M500A	415V	3

FUSE HOLDERS TO SUIT **Refer to page 9**

TKM
415V

FuseMaster



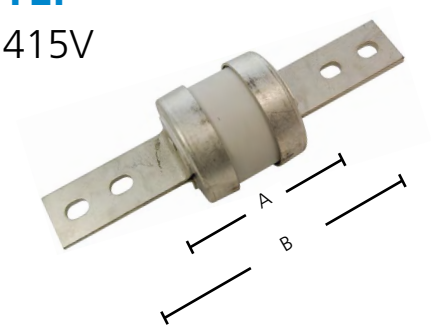
Type gG for cable and line protection

TKM125	EFS 125	–	125A	415V	1
TKM160	EFS 160	–	160A	415V	1
TKM200	EFS 200	–	200A	415V	1
TKM250	EFS 250	250SG7	250A	415V	1
TKM315	–	315SG7	315A	415V	1

FUSE HOLDERS TO SUIT **Refer to page 9**

Bolt-In Centre Tag

TM
TTM
TLM
TMT
TT
TLT
415V

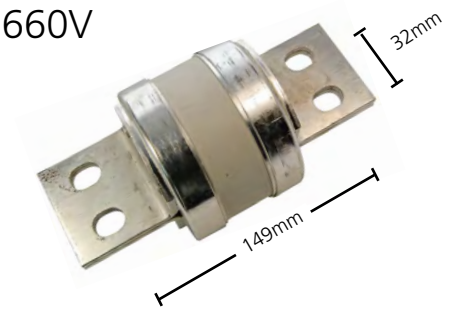


Centre Tag Dimensions (mm)		
PART NO.	FIXING CENTRE A	FIXING CENTRE B
TM	133	184
TTM	133	184
TLM	133	184
TMT	165	229
TT	165	229
TLT	165	229

Type gG for cable and line protection

FUSECO PART NUMBER	BUSSMANN PART NUMBER	MEM PART NUMBER	AMP	VOLTAGE	PACK SIZE
TM355	EF 355	355SH8	355A	415V	1
TM400	EF 400	400SH8	400A	415V	1
TM400M450	–	–	400M450A	415V	1
TM400M500	EF 400M500	–	400M500A	415V	1
TTM450	FF 450	450SH9	450A	415V	1
TTM500	FF 500	500SH9	500A	415V	1
TTM560	FF 560	560SH9	560A	415V	1
TTM630	FF 630	630SH9	630A	415V	1
TLM670	–	–	670A	415V	1
TLM710	GF 710	710SH10	710A	415V	1
TLM750	–	–	750A	415V	1
TLM800	GF 800	800SH10	800A	415V	1
TMT355	–	–	355A	415V	1
TMT400	–	–	400A	415V	1
TT450	FG 450	450SY9	450A	415V	1
TT500	FG 500	500SY9	500A	415V	1
TT560	FG 560	560SY9	560A	415V	1
TT630	FG 630	630SY9	630A	415V	1
TLT670	–	–	670A	415V	1
TLT710	GF 710	710SY10	710A	415V	1
TLT750	–	–	750A	415V	1
TLT800	GG 800	800SY10	800A	415V	1
TLT1000	–	–	1000A	550V	1
TLT1250	–	–	1250A	550V	1

TLU
TXU
415V
660V



Type gG for cable and line protection

TLU450	–	–	450A	415V	1
TLU500	–	–	500A	415V	1
TLU560	–	–	560A	415V	1
TLU630	–	–	630A	415V	1
TLU670	–	–	670A	415V	1
TLU710	GH 710	–	710A	415V	1
TLU750	–	–	750A	415V	1
TLU800	GH 800	–	800A	415V	1
TXU1000	–	–	1000A	660V	1
TXU1250	GH 1250	–	1250A	660V	1

Fuse Holders – DIN Rail and Panel Mount (for NS fuses)

FuseMaster

FB32H

FB32BW

FB32BHA

FB32PWH

PART NUMBER	VOLTAGE	AMP	TO SUIT FUSECO FUSE	GEC PART NUMBER	WIRING TYPE	PACK QTY	COLOUR
FB20H	550VAC	20A	NS	SC20H	Front Connect	10	BLACK
FB32H	550VAC	32A	NS	SC32H	Front Connect	10	BLACK
FB32BW	550VAC	32A	NS	SC32BW	Back Connect	10	BLACK
FB32BHA	550VAC	32A	NS	SC32BHA	Busbar Mount	5	BLACK
FB32P	550VAC	32A	NS	SC32P	Back Stud / Back Stud	5	BLACK
FB20HWH	550VAC	20A	NS	SC20HWH	Front Connect	10	WHITE
FB32HWH	550VAC	32A	NS	SC32HWH	Front Connect	10	WHITE
FB32PWH	550VAC	32A	NS	SC32PWH	Back Stud / Back Stud	5	WHITE
SC63H-D	415VAC	63A	MES	SC63H-D	Front Connect	10	BLACK

Redspot Fuse Holders

RS32H
RS32BW
RS32P
RS32PH

GEC

RS32H

RS32BW

RS32PH

RS32P

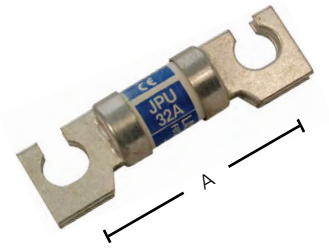
RSL63H

PART NUMBER	VOLTAGE	AMP RATING	TO SUIT FUSECO FUSE	TO SUIT BUSSMANN FUSE	WIRING TYPE	PACK QTY	COLOUR
RS20H	660VAC	20A	NIT	NITD	Front Wired	10	BLACK
RS20P	660VAC	20A	NIT	NITD	Back Wired/2 stud	10	BLACK
RS20PH	660VAC	20A	NIT	NITD	Front/Back Wired 1 stud	10	BLACK
RS20BW	660VAC	20A	NIT	NITD	Back Wired	10	BLACK
RS32H	660VAC	32A	TIA	AAO	Front Wired	10	BLACK
RS32P	660VAC	32A	TIA	AAO	Back Wired/2 stud	10	BLACK
RS32PH	660VAC	32A	TIA	AAO	Front/Back Wired 1 stud	10	BLACK
RS32BW	660VAC	32A	TIA	AAO	Back Wired	10	BLACK
RS63H	660VAC	63A	TIA/TIS	AAO/BAO	Front Wired	10	BLACK
RS63P	660VAC	63A	TIA/TIS	AAO/BAO	Back Wired/2 stud	10	BLACK
RS63PH	660VAC	63A	TIA/TIS	AAO/BAO	Front/Back Wired 1 stud	10	BLACK
RS63BW	660VAC	63A	TIA/TIS	AAO/BAO	Back Wired	10	BLACK
RS100H	660VAC	100A	TCP	CEO	Front Wired	5	BLACK
RS100P	660VAC	100A	TCP	CEO	Back Wired/2 stud	5	BLACK
RS100PH	660VAC	100A	TCP	CEO	Front/Back Wired 1 stud	5	BLACK
RS100BW	660VAC	100A	TCP	CEO	Back Wired	5	BLACK
RS200H	660VAC	200A	TBC/TC/TF	CD/DD	Front Wired	1	BLACK
RS200P	660VAC	200A	TBC/TC/TF	CD/DD	Back Wired/2 stud	1	BLACK
RS200PH	660VAC	200A	TBC/TC/TF	CD/DD	Front/Back Wired 1 stud	1	BLACK
RS400H	660VAC	400A	TKM	EFS	Front Wired	1	BLACK
RS400P	660VAC	400A	TKM	EFS	Back Wired/2 stud	1	BLACK
RS400PH	660VAC	400A	TKM	EFS	Front/Back Wired 1 stud	1	BLACK
RS20HWH	660VAC	20A	NIT	NITD	Front Wired	10	WHITE
RS20PWH	660VAC	20A	NIT	NITD	Back Wired/2 stud	10	WHITE
RS32HWH	660VAC	32A	TIA	AAO	Front Wired	10	WHITE
RS32PWH	660VAC	32A	TIA	AAO	Back Wired/2 stud	10	WHITE
RS63HWH	660VAC	63A	TIA/TIS	AAO/BAO	Front Wired	10	WHITE
RS63PWH	660VAC	63A	TIA/TIS	AAO/BAO	Back Wired/2 stud	10	WHITE
RS100HWH	660VAC	100A	TCP	CEO	Front Wired	5	WHITE
RS100PWH	660VAC	100A	TCP	CEO	Back Wired/2 stud	5	WHITE
RSL63H	1200VAC	63A	HD36	HD36	Front Wired	20	WHITE

Type J

JHU
JPU
JSU

415VAC



Type J Dimensions (mm)	
PART NO.	CENTRE A
JHU	76
JPU	82
JSU	92

Class gG for cable and line protection

PART NO.	AMP
JHU20	20A
JHU32	32A
JHU40	40A
JHU50	50A
JHU63	63A
JHU80	80A
JHU100	100A
JHU125	125A
JHU160	160A
JHU200	200A
JHU250	250A
JHU315	315A

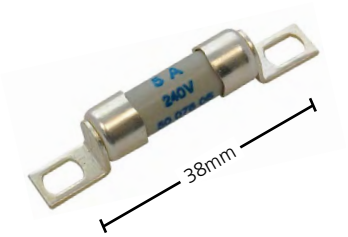
PART NO.	AMP
JPU20	20A
JPU32	32A
JPU40	40A
JPU50	50A
JPU63	63A
JPU80	80A
JPU100	100A
JPU125	125A
JPU160	160A
JPU200	200A
JPU250	250A
JPU315	315A
JPU355	355A
JPU400	400A
JPU450	450A
JPU500	500A
JPU560	560A
JPU630	630A

PART NO.	AMP
JSU20	20A
JSU32	32A
JSU40	40A
JSU50	50A
JSU63	63A
JSU80	80A
JSU100	100A
JSU125	125A
JSU160	160A
JSU200	200A
JSU250	250A
JSU315	315A
JSU355	355A
JSU400	400A
JSU450	450A
JSU500	500A
JSU560	560A
JSU630	630A
JSU800	800A

Ultra Rapid – Single Body

5007606

240VAC
(aR)



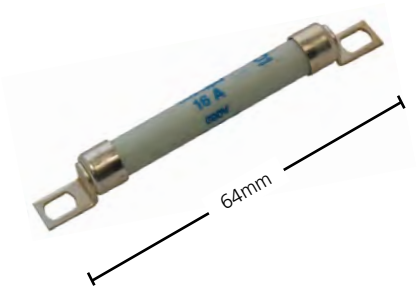
Class aR for the protection of semiconductors

PART NO.	AMP
5007606-5	5A
5007606-6	6A
5007606-10	10A
5007606-12	12A
5007606-16	16A
5007606-20	20A

FUSE HOLDERS TO SUIT **Contact Fuseco**

5007706

690VAC
(aR)



Class aR for the protection of semiconductors

PART NO.	AMP
5007706-6	6A
5007706-10	10A
5007706-12	12A
5007706-16	16A
5007706-20	20A

FUSE HOLDERS TO SUIT **Contact Fuseco**

Ultra Rapid – Single Body

5005306

SIBA

240VAC
(aR)

Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5005306-7	7A	**5005306-50**	50A
5005306-10	10A	**5005306-63**	63A
5005306-12.5	12.5A	**5005306-75**	75A
5005306-16	16A	**5005306-80**	80A
5005306-20	20A	**5005306-100**	100A
5005306-25	25A	**5005306-110**	110A
5005306-32	32A	**5005306-125**	125A
5005306-35	35A	**5005306-160**	160A
5005306-40	40A	**5005306-180**	180A

FUSE HOLDERS TO SUIT **Refer to page 14**

5005406

SIBA

240VAC
(aR)

Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5005406-100	100A	**5005406-270**	270A
5005406-125	125A	**5005406-300**	300A
5005406-160	160A	**5005406-315**	315A
5005406-180	180A	**5005406-350**	350A
5005406-200	200A	**5005406-355**	355A
5005406-225	225A	**5005406-400**	400A
5005406-250	250A	**5005406-450**	450A

FUSE HOLDERS TO SUIT **Refer to page 14**

5007306

SIBA

690VAC
(aR)

Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5007306-8	8A	**5007306-50**	50A
5007306-10	10A	**5007306-56**	56A
5007306-16	16A	**5007306-63**	63A
5007306-20	20A	**5007306-71**	71A
5007306-25	25A	**5007306-75**	75A
5007306-32	32A	**5007306-80**	80A
5007306-35	35A	**5007306-90**	90A
5007306-40	40A	**5007306-100**	100A
5007306-45	45A	**5007306-110**	110A

FUSE HOLDERS TO SUIT **Refer to page 14**

5007406

SIBA

690VAC
(aR)

Class aR for the protection of semiconductors

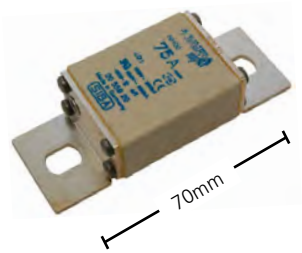
PART NO.	AMP	PART NO.	AMP
5007406-100	100A	**5007406-200**	200A
5007406-125	125A	**5007406-250**	250A
5007406-150	150A	**5007406-275**	275A
5007406-160	160A	**5007406-315**	315A
5007406-180	180A	**5007406-355**	355A

FUSE HOLDERS TO SUIT **Refer to page 14**

Ultra Rapid – Double Body

2055920

690VAC
sqare body
(aR)



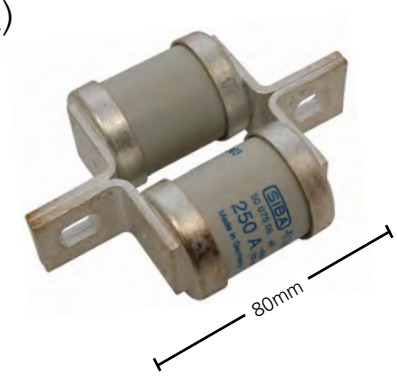
Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
2055920-16	16A	**2055920-100**	100A
2055920-25	25A	**2055920-110**	110A
2055920-32	32A	**2055920-125**	125A
2055920-35	35A	**2055920-140**	140A
2055920-40	40A	**2055920-150**	150A
2055920-50	50A	**2055920-160**	160A
2055920-63	63A	**2055920-180**	180A
2055920-75	75A	**2055920-200**	200A
2055920-80	80A	**2055920-250**	250A
2055920-85	85A	**2055920-315**	315A
2055920-90	90A		

FUSE HOLDERS TO SUIT **Refer to page 14**

5007506

690VAC
(aR)



Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5007506-180	180A	**5007506-400**	400A
5007506-200	200A	**5007506-450**	450A
5007506-225	225A	**5007506-500**	500A
5007506-250	250A	**5007506-550**	550A
5007506-280	280A	**5007506-630**	630A
5007506-315	315A	**5007506-710**	710A
5007506-355	355A		

FUSE HOLDERS TO SUIT **Refer to page 14**

5007106

240VAC
(aR)

Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5007106-200	200A	**5007106-500**	500A
5007106-300	300A	**5007106-630**	630A
5007106-350	350A	**5007106-710**	710A
5007106-400	400A	**5007106-800**	800A
5007106-450	450A	**5007106-900**	900A
5007106-500	500A		

FUSE HOLDERS TO SUIT **Refer to page 14**

F Series

FE

Bussmann

690VAC
(aR)

Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
FE35	35A	**FE71**	71A
FE40	40A	**FE80**	80A
FE45	45A	**FE90**	90A
FE50	50A	**FE100**	100A
FE63	63A	FUSE HOLDERS TO SUIT	**Refer to page 14**

FM

Bussmann

690VAC
(aR)

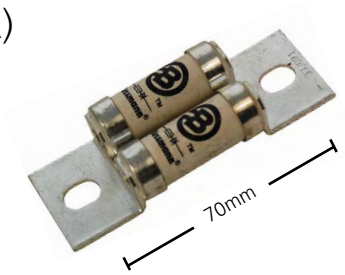
Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
FM180	180A	**FM280**	280A
FM200	200A	**FM315**	315A
FM225	225A	**FM350**	350A
FM250	250A	FUSE HOLDERS TO SUIT	**Refer to page 14**

FEE

Bussmann

690VAC
(aR)



Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
FEE100	100A	**FEE160**	160A
FEE120	120A	**FEE180**	180A
FEE140	140A	**FEE200**	200A
		FUSE HOLDERS TO SUIT	**Refer to page 14**

FMM

Bussmann

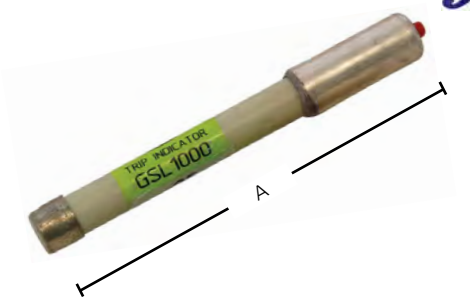
690VAC
(aR)

Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
FMM400	400A	**FMM550**	550A
FMM450	450A	**FMM630**	630A
FMM500	500A	**FMM700**	700A
		FUSE HOLDERS TO SUIT	**Refer to page 14**

Trip Indicators

GSL



'GSL' trip indicator		
PART NO.	VOLTAGE	LENGTH A (mm)
GSL2000	1300V	121

TI

'TI' Trip indicator		
PART NO.	VOLTAGE	LENGTH A (mm)
TI250	250V	37.6mm
TI500	500V	47.5mm
TI600	600V	55.7mm
TI700	700V	61.8mm

Trip Indicator Kit

EC
MC

'TI' trip indicator with 2 clips		
PART NO.	VOLTAGE	TO SUIT FUSES
EC-250	250V	5005306
MC-250	250V	5005406, 5007106
EC-600	600V	5007306, FE, FEE
MC-600	600V	5007406, 5007506, FM, FMM
MC-700	700V	5007406, 5007506, FM, FMM

Fuse Base

LSCR

700VAC/DC
modular fuse bases

Fuse holders to suit bolt in fuses	
PART NO.	AMP
LSCR001	400A
LSCR002	800A

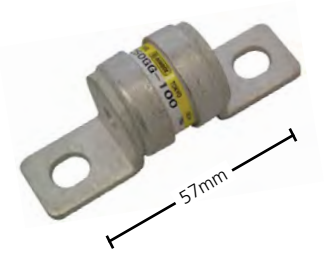
Contact Fuseco for 1000VAC/DC modular fuse base

LSCR001 – Suited to 5005306, 5005406 (up to 400A), 5007306, FE, 5007406, FM, 2055920. FEE, 25SH.
LSCR002 – Suited to 5005406, 5007406, FM, 5007506, FMM, 5007106.

Ultra Rapid – Hinode

250GG

250VAC
ultra rapid



Semiconductor device protection

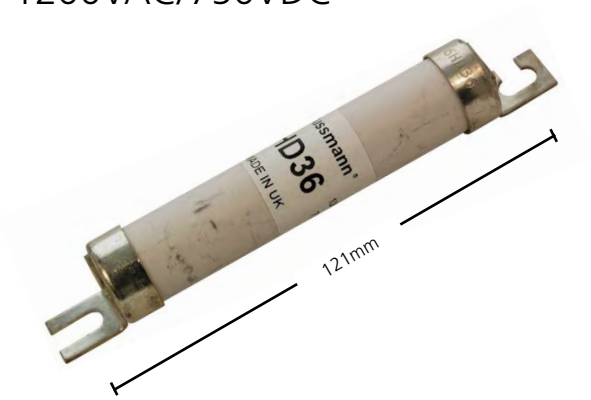
PART NO.	AMP	PART NO.	AMP
250GG50	50A	**250GG125**	125A
250GG60	60A	**250GG140**	140A
250GG75	75A	**250GG150**	150A
250GG85	85A	**250GG160**	160A
250GG100	100A	**250GG180**	180A
250GG110	110A	**250GG200**	200A

Please note that there are many styles of HINODE & KYOSAN fuses, usually found in Japanese made equipment. Please contact Fuseco for information on other styles.

Traction Fuses

HD36

1200VAC/750VDC



Fast Acting for traction applications

PART NO.	AMP	PART NO.	AMP
HD36-1	1A	**HD36-15**	15A
HD36-2	2A	**HD36-20**	20A
HD36-4	4A	**HD36-25**	25A
HD36-6	6A	**HD36-30**	30A
HD36-10	10A		

FUSE HOLDERS TO SUIT **Refer to page 9 (RSL63H)**

NATO Tagged Fuses

440VAC

Fast acting for NATO applications

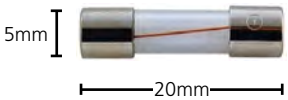
PART NO.	AMP	A (mm)	PART NO.	AMP	A (mm)
059-0114	500mA	45	**059-0122**	10A	56
059-0115	1A	45	**059-0123**	15A	56
059-0116	2A	45	**059-0124**	20A	56
059-0117	3A	45	**012-0067**	40A	56
059-0118	5A	45	**011-9127**	50A	56
059-0119	7A	45	**012-0141**	60A	56
059-0120	10A	45	**059-0127**	60A	70
059-0121	15A	45	**059-0129**	100A	70
011-9679	20A	45	**011-9128**	125A	70
012-0140	30A	45			

FUSE HOLDERS TO SUIT **Contact Fuseco**

Australux 5 x 20mm

M205

250VAC
fast, glass

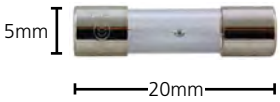


Fast acting for general applications

PART NO.	AMP RATING	PART NO.	AMP RATING
M205-100MA	100mA	**M205-1.6A**	1.6A
M205-125MA	125mA	**M205-2A**	2A
M205-160MA	160mA	**M205-2.5A**	2.5A
M205-200MA	200mA	**M205-3.15A**	3.15A
M205-250MA	250mA	**M205-4A**	4A
M205-315MA	315mA	**M205-5A**	5A
M205-400MA	400mA	**M205-6.3A**	6.3A
M205-500MA	500mA	**M205-8A**	8A
M205-630MA	630mA	**M205-10A**	10A
M205-800MA	800mA	**M205-15A**	15A
M205-1A	1A	**M205-20A**	20A
M205-1.25A	1.25A		

DA205

250VAC
slow, glass

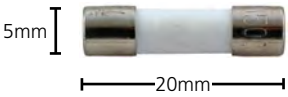


Delayed action performance

PART NO.	AMP RATING	PART NO.	AMP RATING
DA205-100MA	100mA	**DA205-1.25A**	1.25A
DA205-125MA	125mA	**DA205-1.6A**	1.6A
DA205-160MA	160mA	**DA205-2A**	2A
DA205-200MA	200mA	**DA205-2.5A**	2.5A
DA205-250MA	250mA	**DA205-3.15A**	3.15A
DA205-315MA	315mA	**DA205-4A**	4A
DA205-400MA	400mA	**DA205-5A**	5A
DA205-500MA	500mA	**DA205-6.3A**	6.3A
DA205-630MA	630mA	**DA205-8A**	8A
DA205-800MA	800mA	**DA205-10A**	10A
DA205-1A	1A	**DA205-15A**	15A

MP205

250VAC
fast, ceramic

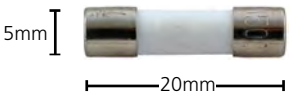


Fast acting for general applications

PART NO.	AMP	PART NO.	AMP
MP205-250MA	250mA	**MP205-2A**	2A
MP205-315MA	315mA	**MP205-2.5A**	2.5A
MP205-400MA	400mA	**MP205-3.15A**	3.15A
MP205-500MA	500mA	**MP205-4A**	4A
MP205-630MA	630mA	**MP205-5A**	5A
MP205-800MA	800mA	**MP205-6.3A**	6.3A
MP205-1A	1A	**MP205-8A**	8A
MP205-1.25A	1.25A	**MP205-10A**	10A
MP205-1.6A	1.6A	**MP205-15A**	15A

MP205DA

250VAC
slow, ceramic



Delayed action performance

PART NO.	AMP	PART NO.	AMP
MP205DA-200MA	200mA	**MP205DA-2A**	2A
MP205DA-250MA	250mA	**MP205DA-2.5A**	2.5A
MP205DA-315MA	315mA	**MP205DA-3.15A**	3.15
MP205DA-400MA	400mA	**MP205DA-4A**	4A
MP205DA-500MA	500mA	**MP205DA-5A**	5A
MP205DA-630MA	630mA	**MP205DA-6.3A**	6.3A
MP205DA-800MA	800mA	**MP205DA-8A**	8A
MP205DA-1A	1A	**MP205DA-10A**	10A
MP205DA-1.25A	1.25A	**MP205DA-15A**	15A
MP205DA-1.6A	1.6A		

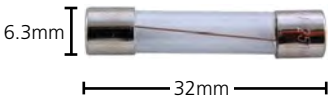
FUSE HOLDERS TO SUIT
Refer to pages 24, 25

Australux 6.3 x 32mm

3AG

"Australux"

250VAC
fast, glass



Fast acting for general applications

PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
3AG-100MA	100mA	**3AG-1A**	1A	**3AG-7.5A**	7.5A
3AG-125MA	125mA	**3AG-1.25A**	1.25A	**3AG-8A**	8A
3AG-150MA	150mA	**3AG-1.5A**	1.5A	**3AG-10A**	10A
3AG-200MA	200mA	**3AG-2A**	2A	**3AG-12A**	12A
3AG-250MA	250mA	**3AG-2.5A**	2.5A	**3AG-15A**	15A
3AG-300MA	300mA	**3AG-3A**	3A	**3AG-20A**	20A
3AG-375MA	375mA	**3AG-4A**	4A	**3AG-25A***	25A
3AG-500MA	500mA	**3AG-5A**	5A	**3AG-30A***	30A
3AG-600MA	600mA	**3AG-6A**	6A	**3AG-35A***	35A
3AG-750MA	750mA	**3AG-7A**	7A	*** Ceramic body**	

3AGDA

"Australux"

250VAC
slow, glass

Delayed action performance

PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
3AGDA-200MA	200mA	**3AGDA-1A**	1A	**3AGDA-5A**	5A
3AGDA-250MA	250mA	**3AGDA-1.25A**	1.25A	**3AGDA-6A**	6A
3AGDA-300MA	300mA	**3AGDA-1.5A**	1.5A	**3AGDA-6.3A**	6.3A
3AGDA-315MA	315mA	**3AGDA-1.6A**	1.6A	**3AGDA-7A**	7A
3AGDA-400MA	400mA	**3AGDA-2A**	2A	**3AGDA-8A**	8A
3AGDA-500MA	500mA	**3AGDA-2.5A**	2.5A	**3AGDA-10A**	10A
3AGDA-600MA	600mA	**3AGDA-3A**	3A	**3AGDA-12A**	12A
3AGDA-630MA	630mA	**3AGDA-3.15A**	3.15A	**3AGDA-15A**	15A
3AGDA-750MA	750mA	**3AGDA-3.5A**	3.5A		
3AGDA-800MA	800mA	**3AGDA-4A**	4A		

3AB

"Australux"

250VAC
fast, ceramic

Fast acting for general applications

PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
3AB-300MA	300mA	**3AB-1A**	1A	**3AB-6A**	6
3AB-350MA	350mA	**3AB-1.5A**	1.5A	**3AB-7A**	7A
3AB-375MA	375mA	**3AB-1.6A**	1.6A	**3AB-8A**	8A
3AB-400MA	400mA	**3AB-2A**	2A	**3AB-10A**	10A
3AB-500MA	500mA	**3AB-2.5A**	2.5A	**3AB-12A**	12A
3AB-600MA	600mA	**3AB-3A**	3A	**3AB-15A**	15A
3AB-630MA	630mA	**3AB-3.5A**	3.5A	**3AB-20A**	20A
3AB-750MA	750mA	**3AB-4A**	4A	**3AB-25A**	25A
3AB-800MA	800mA	**3AB-5A**	5A	**3AB-30A**	30A

3ABDA

"Australux"

250VAC
slow, ceramic

Delayed action performance

PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
3ABDA-500MA	500mA	**3ABDA-1.5A**	1.5A	**3ABDA-7A**	7A
3ABDA-600MA	600mA	**3ABDA-1.6A**	1.6A	**3ABDA-8A**	8A
3ABDA-630MA	630mA	**3ABDA-2A**	2A	**3ABDA-10A**	10A
3ABDA-700MA	700mA	**3ABDA-2.5A**	2.5A	**3ABDA-12A**	12A
3ABDA-750MA	750mA	**3ABDA-3A**	3A	**3ABDA-15A**	15A
3ABDA-800MA	800mA	**3ABDA-3.15A**	3.15A	**3ABDA-20A**	20A
3ABDA-1A	1A	**3ABDA-4A**	4A	**3ABDA-25A**	25A
3ABDA-1.2A	1.2A	**3ABDA-5A**	5A	**3ABDA-30A**	30A
3ABDA-1.25A	1.25A	**3ABDA-6A**	6A		

FUSE HOLDERS TO SUIT **Refer to pages 24, 25**

Australux Fuse Kits

5 x 20mm fast acting glass fuses

VOLTAGE	**250VAC**
PACKAGING	**180 fuses in total 10 of each rating in 18 compartments**

PART NO.	FUSE RATINGS INCLUDED:
M205-KIT	100mA 160mA 250mA 315mA 500mA 630mA 800mA 1A 1.6A 2A 2.5A 3.15A 4A 5A 6.3A 8A 10A 15A

5 x 20mm slow acting glass fuses

VOLTAGE	**250VAC**
PACKAGING	**180 fuses in total 10 of each rating in 18 compartments**

PART NO.	FUSE RATINGS INCLUDED:
DA205-KIT	100mA 125mA 160mA 250mA 315mA 400mA 500mA 630mA 800mA 1A 1.6A 2A 2.5A 3.15 A 4A 5A 6.3A 8A

6.3 x 32mm fast acting glass fuses

VOLTAGE	**250VAC**
PACKAGING	**180 fuses in total 10 of each rating in 18 compartments**

PART NO.	FUSE RATINGS INCLUDED:
3AG-KIT	100mA 150mA 250mA 375mA 500mA 750mA 1A 1.5A 2A 2.5A 3A 4A 5A 6A 7.5A 10A 15A 20A

6.3 x 32mm slow acting glass fuses

VOLTAGE	**250VAC**
PACKAGING	**180 fuses in total 10 of each rating in 18 compartments**

PART NO.	FUSE RATINGS INCLUDED:
3AGDA-KIT	200mA 250mA 375mA 500mA 750mA 800mA 1A 1.5A 2A 3.15A 4A 5A 6.3A 7A 8A 10A 12A 15A

Mixed M205/3AG Fuses

VOLTAGE	**250VAC**
PACKAGING	**180 fuses in total 10 of each rating in 18 compartments**

PART NO.	FUSE RATINGS INCLUDED:
M205 3AG-KIT	**M205 fuses** 250mA 500mA 1A 2A 3.15A 5A 6.3A 10A 15A **3AG fuses** 250mA 375mA 500mA 1A 2A 5A 7.5A 10A 15A

Australux Fuse Box

A selection of 3AG and M205 fast acting glass fuses

VOLTAGE	**250VAC**
PACKAGING	**600 fuses in total**

PART NO.	DESCRIPTION
FUSE-BOX-001	A popular storage option that doesn't take up a lot of space! Can be placed on a shelf or counter, screwed into a panel or hung. 20 trays containing the most common 3AG & M205 fuses. 30 fuses per tray = a total of 600 fuses.

FUSES INCLUDED:
M205 500mA 1A 1.6A 2A 2.5A 3.15A 4A 5A 6.3A 10A **3AG** 500mA 1A 2A 3A 4A 5A 7.5A 10A 15A 20A

4.5 x 15mm

225

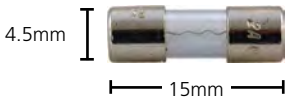
250VAC
fast, glass

Fast acting for general applications. Also known as '2AG' within the USA.

PART NO.	AMP	PART NO.	AMP
225-375MA	375MA	**225-3.5A**	3.5A
225-500MA	500MA	**225-4A**	4A
225-750MA	750MA	**225-5A**	5A
225-1A	1A	**225-6A**	6A
225-1.5A	1.5A	**225-7A**	7A
225-2A	2A	**225-8A**	8A
225-2.5A	2.5A	**225-10A**	10A
225-3A	3A		

229

250VAC
slow, glass



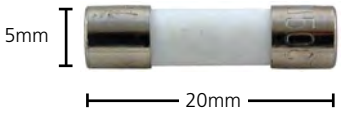
Slow acting for general applications

PART NO.	AMP	PART NO.	AMP
229-250MA	250MA	**229-2A**	2A
229-350MA	350MA	**229-2.25A**	2.25A
229-375MA	375MA	**229-2.5A**	2.5A
229-500MA	500MA	**229-3A**	3A
229-600MA	600MA	**229-3.5A**	3.5A
229-750MA	750MA	**229-4A**	4A
229-1A	1A	**229-5A**	5A
229-1.25A	1.25A	**229-6A**	6A
229-1.5A	1.5A	**229-7A**	7A

5 x 20mm

7000140

250VAC
ultra rapid (aR)



Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
7000140-100MA	100mA	**7000140-1.6A**	1.6A
7000140-125MA	125mA	**7000140-2A**	2A
7000140-160MA	160mA	**7000140-2.5A**	2.5A
7000140-200MA	200mA	**7000140-3.15A**	3.15A
7000140-250MA	250mA	**7000140-4A**	4A
7000140-315MA	315mA	**7000140-5A**	5A
7000140-400MA	400mA	**7000140-6.3A**	6.3A
7000140-500MA	500mA	**7000140-8A**	8A
7000140-630MA	630mA	**7000140-10A**	10A
7000140-800MA	800mA	**7000140-12.5A**	12.5A
7000140-1A	1A		

5 x 25mm

171525

SIBA

250VAC
fast, glass

Fast acting for general applications

PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
171525-32MA	32mA	**171525-315MA**	315mA	**171525-2A**	2A
171525-50MA	50mA	**171525-400MA**	400mA	**171525-2.5A**	2.5A
171525-63MA	63mA	**171525-500MA**	500mA	**171525-3.15A**	3.15A
171525-80MA	80mA	**171525-630MA**	630mA	**171525-4A**	4A
171525-100MA	100mA	**171525-800MA**	800mA	**171525-5A**	5A
171525-125MA	125mA	**171525-1A**	1A	**171525-6.3A**	6.3A
171525-160MA	160mA	**171525-1.25A**	1.25A	**171525-8A**	8A
171525-200MA	200mA	**171525-1.6A**	1.6A	**171525-10A**	10A
171525-250MA	250mA				

171526

SIBA

250VAC
fast, ceramic

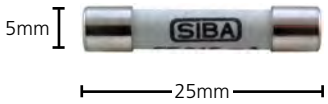
Fast acting with indicator

PART NO.	AMP	COLOUR	PART NO.	AMP	COLOUR
171526-1.6A	1.6A	ORANGE	**171526-5A**	5A	WHITE
171526-2A	2A	BLUE	**171526-6.3A**	6.3A	GREEN
171526-2.5A	2.5A	YELLOW	**171526-8A**	8A	GREY
171526-3.15A	3.15A	BLACK	**171526-10A**	10A	RED
171526-4A	4A	BROWN			

172526

SIBA

250VAC
medium time delay
ceramic



Medium time delay with indicator

PART NO.	AMP	COLOUR	PART NO.	AMP	COLOUR
172526-50MA	50MA	WHITE	**172526-800MA**	800MA	GREY
172526-63MA	63MA	GREEN	**172526-1A**	1A	RED
172526-80MA	80MA	GREY	**172526-1.25A**	1.25A	LILAC
172526-100MA	100MA	RED	**172526-1.6A**	1.6A	ORANGE
172526-125MA	125MA	LILAC	**172526-2A**	2A	BLUE
172526-160MA	160MA	ORANGE	**172526-2.5A**	2.5A	YELLOW
172526-200MA	200MA	BLUE	**172526-3.15A**	3.15A	BLACK
172526-250MA	250MA	YELLOW	**172526-4A**	4A	BROWN
172526-315MA	315MA	BLACK	**172526-5A**	5A	WHITE
172526-400MA	400MA	BROWN	**172526-6.3A**	6.3A	GREEN
172526-500MA	500MA	WHITE	**172526-8A**	8A	GREY
172526-630MA	630MA	GREEN	**172526-10A**	10A	RED

7008913

SIBA

450VAC
fast, ceramic

Fast acting with indicator. Lloyds approved.

PART NO.	AMP	COLOUR	PART NO.	AMP	COLOUR
7008913-250MA	250MA	YELLOW	**7008913-2A**	2A	BLUE
7008913-315MA	315MA	BLACK	**7008913-2.5A**	2.5A	YELLOW
7008913-400MA	400MA	BROWN	**7008913-3.15A**	3.15A	BLACK
7008913-500MA	500MA	WHITE	**7008913-4A**	4A	BROWN
7008913-800MA	800MA	GREY	**7008913-5A**	5A	WHITE
7008913-1A	1A	RED	**7008913-6.3A**	6.3A	GREEN
7008913-1.25A	1.25A	LILAC	**7008913-8A**	8A	GREY
7008913-1.6A	1.6A	ORANGE	**7008913-10A**	10A	RED

FUSE HOLDERS TO SUIT **Refer to pages 24, 25**

5 x 30mm

172530

SIBA

500VAC
medium time delay
glass

Transparent (32mA-1A)
Sand Filled (1.25A-10A)

Medium time delay performance

PART NO.	AMP	PART NO.	AMP
172530-32MA	32mA	**172530-800MA**	800mA
172530-50MA	50mA	**172530-1A**	1A
172530-63MA	63mA	**172530-1.25A**	1.25A
172530-80MA	80mA	**172530-1.6A**	1.6A
172530-100MA	100mA	**172530-2A**	2A
172530-125MA	125mA	**172530-2.5A**	2.5A
172530-160MA	160mA	**172530-3.15A**	3.15A
172530-200MA	200mA	**172530-4A**	4A
172530-250MA	250mA	**172530-5A**	5A
172530-315MA	315mA	**172530-6.3A**	6.3A
172530-400MA	400mA	**172530-8A**	8A
172530-500MA	500mA	**172530-10A**	10A
172530-630MA	630mA		

171530

SIBA

500VAC
fast, glass

Transparent (32mA-1A)
Sand Filled (1.25A-10A)

Fast acting for general applications

PART NO.	AMP	PART NO.	AMP
171530-32MA	32mA	**171530-800MA**	800mA
171530-50MA	50mA	**171530-1A**	1A
171530-63MA	63mA	**171530-1.25A**	1.25A
171530-80MA	80mA	**171530-1.6A**	1.6A
171530-100MA	100mA	**171530-2A**	2A
171530-125MA	125mA	**171530-2.5A**	2.5A
171530-160MA	160mA	**171530-3.15A**	3.15A
171530-200MA	200mA	**171530-4A**	4A
171530-250MA	250mA	**171530-5A**	5A
171530-315MA	315mA	**171530-6.3A**	6.3A
171530-400MA	400mA	**171530-8A**	8A
171530-500MA	500mA	**171530-10A**	10A
171530-630MA	630mA		

6.3 x 22mm

7AG

"Australux"

32 / 125VAC
fast, glass

Fast acting for general applications. Also known as '2AG' outside the USA.

PART NO.	AMP	VOLTAGE
7AG-100MA	100mA	125V
7AG-250MA	250mA	125V
7AG-500MA	500mA	125V
7AG-1A	1A	125V
7AG-1.5A	1.5A	125V
7AG-2A	2A	125V
7AG-3A	3A	125V
7AG-5A	5A	125V

PART NO.	AMP	VOLTAGE
7AG-7.5A	7.5A	32V
7AG-10A	10A	32V
7AG-15A	15A	32V
7AG-20A	20A	32V
7AG-25A	25A	32V
7AG-30A	30A	32V
7AG-35A	35A	32V

6.3 x 25.4mm

8AG

"Australux"

125 / 250VAC
fast, glass

Fast acting for general applications

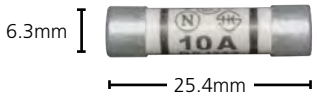
PART NO.	AMP	VOLTAGE
8AG-100MA	100mA	250V
8AG-250MA	250mA	250V
8AG-500MA	500mA	250V
8AG-1A	1A	250V
8AG-1.5A	1.5A	250V
8AG-2A	2A	250V
8AG-3A	3A	250V
8AG-4A	4A	250V
8AG-5A	5A	250V

PART NO.	AMP	VOLTAGE
8AG-7.5A	7.5A	125V
8AG-8A	8A	125V
8AG-10A	10A	125V
8AG-15A	15A	125V
8AG-20A	20A	125V
8AG-25A	25A	125V
8AG-30A	30A	125V
8AG-35A	35A	125V

PL

LAWSON

240VAC
fast, ceramic



Fast acting for general applications. Known as 'Plug Fuse' for protection applications in the UK. BS1362 approval.

PART NO.	AMP
PL-1A	1A
PL-2A	2A
PL-3A	3A
PL-5A	5A

PART NO.	AMP
PL-7A	7A
PL-10A	10A
PL-13A	13A

TDC600

Bussmann

600VAC
fast, ceramic

Fast acting for general applications.
BS1362 approval.

PART NO.	AMP
TDC600-2A	2A
TDC600-10A	10A

6.3 x 32mm Ceramic

189020

SIBA

500VAC*
fast

Fast acting for general applications. Also known as 7006563 Series

PART NO.	AMP	* VOLTAGE	PART NO.	AMP	* VOLTAGE
189020-160MA	160mA	500V	**189020-2.5A**	2.5A	500V
189020-200MA	200mA	500V	**189020-3.15A**	3.15A	500V
189020-250MA	250mA	500V	**189020-4A**	4A	500V
189020-315MA	315mA	500V	**189020-5A**	5A	500V
189020-400MA	400mA	500V	**189020-6.3A**	6.3A	500V
189020-500MA	500mA	500V	**189020-8A**	8A	500V
189020-630MA	630mA	500V	**189020-10A**	10A	500V
189020-800MA	800mA	500V	**189020-12.5A**	12.5A	500V
189020-1A	1A	500V	**189020-15A**	15A	500V
189020-1.25A	1.25A	500V	**189020-16A**	16A	500V
189020-1.6A	1.6A	500V	**189020-20A***	20A	440V
189020-2A	2A	500V	**189020-25A***	25A	440V

189140

SIBA

500VAC*
slow

Delayed action performance. Also known as 7006565 Series

PART NO.	AMP	* VOLTAGE	PART NO.	AMP	* VOLTAGE
189140-100MA	100mA	500V	**189140-2A**	2A	500V
189140-125MA	125mA	500V	**189140-2.5A**	2.5A	500V
189140-160MA	160mA	500V	**189140-3.15A**	3.15A	500V
189140-200MA	200mA	500V	**189140-4A**	4A	500V
189140-250MA	250mA	500V	**189140-5A**	5A	500V
189140-315MA	315mA	500V	**189140-6.3A**	6.3A	500V
189140-400MA	400mA	500V	**189140-8A**	8A	500V
189140-500MA	500mA	500V	**189140-10A**	10A	500V
189140-630MA	630mA	500V	**189140-12.5A**	12.5A	500V
189140-800MA	800mA	500V	**189140-15A**	15A	500V
189140-1A	1A	500V	**189140-16A**	16A	500V
189140-1.25A	1.25A	500V	**189140-20A***	20A	440V
189140-1.6A	1.6A	500V	**189140-25A***	25A	440V
			189140-32A*	32A	250V

7009463

SIBA

600VAC
fast

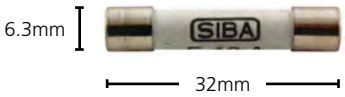
Fast acting for general applications and digital measuring equipment

PART NO.	AMP	PART NO.	AMP
7009463-200MA	200mA	**7009463-2.5A**	2.5A
7009463-400MA	400mA	**7009463-3A**	3A
7009463-500MA	500mA	**7009463-5A**	5A
7009463-800MA	800mA	**7009463-7A**	7A
7009463-1A	1A	**7009463-10A**	10A
7009463-2A	2A		

7012540

SIBA

500 / 700VAC
ultra rapid (aR)



Class aR for the protection of semiconductors

PART NO.	AMP	VOLTAGE	PART NO.	AMP	VOLTAGE
7012540-160MA	160mA	700V	**7012540-2A**	2A	700V
7012540-200MA	200mA	700V	**7012540-2.5A**	2.5A	600V
7012540-250MA	250mA	700V	**7012540-3.15A**	3.15A	600V
7012540-315MA	315mA	700V	**7012540-4A**	4A	600V
7012540-400MA	400mA	700V	**7012540-5A**	5A	600V
7012540-500MA	500mA	700V	**7012540-6.3A**	6.3A	600V
7012540-630MA	630mA	700V	**7012540-8A**	8A	600V
7012540-800MA	800mA	700V	**7012540-10A**	10A	600V
7012540-1A	1A	700V	**7012540-12.5A**	12.5A	500V
7012540-1.25A	1.25A	700V	**7012540-16A**	16A	500V
7012540-1.6A	1.6A	700V	**7012540-20A**	20A	500V

6.3 x 32mm

7017240

SIBA

1000VAC/DC
ultra rapid (aR)

Class aR for Digital Measuring Instruments

PART NO.	AMP	PART NO.	AMP
7017240-100MA	100mA	**7017240-630MA**	630mA
7017240-200MA	200mA	**7017240-800MA**	800mA
7017240-250MA	250mA	**7017240-1A**	1A
7017240-315MA	315mA	**7017240-1.6A**	1.6A
7017240-400MA	400mA	**7017240-2A**	2A
7017240-500MA	500mA		

NATO Series

Bussmann

440VAC

Fast acting for NATO applications

PART NO.	AMP	PART NO.	AMP
059-0107	250mA	**059-0112**	5A
059-0108	500mA	**059-0113**	7A
059-0109	1A	**011-9925**	10A
059-0110	2A	**011-9926**	15A
059-0111	3A		

6.5 x 40mm

MWF

5000VAC
microwave oven fuse

Specially designed for microwave oven applications

PART NO.	AMP	PART NO.	AMP
MWF60	600mA	**MWF80**	800mA
MWF70	700mA	**MWF90**	900mA
MWF75	750mA	**MWF100**	1A

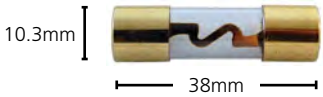
Supplied with in-line holders

10.3 x 38mm

5AG

"Australux"

32VAC/DC
fast, glass



Fast acting. Gold plated for use in audio.

PART NO.	AMP	PART NO.	AMP
5AG-20	20A	**5AG-40**	40A
5AG-25	25A	**5AG-50**	50A
5AG-30	30A	**5AG-60**	60A

FUSE HOLDERS TO SUIT **Refer to page 34**

In-Line Holders

HF-011 (5 x 20mm)

Screw cap, 10A @ 250V
15A @ 125V

HF-013 (5 x 20mm)

Bayonet cap (half twist), 15A @ 250V
25A @ 125V

HF-012 (6.3 x 32mm)

Screw cap, 20A @ 250V
25A @ 125V

HF-014 (6.3 x 32mm)

Bayonet cap (half twist), 20A @ 250V
25A @ 125V

E1206 (6.3 x 32mm)

Screw cap, 25A @ 250V

Fuse Clips and Blocks

HF-004 (5 x 20mm)
Nickel plated with end stops, 20A @ 125V

HF-005 (6.3 x 32mm)
Nickel plated, 20A @ 125V

HF-004/P (5 x 20mm)
Phosphor bronze body, tin plated, 20A @ 125V

6X32801 (6.3 x 32mm)
Moulded Base Fuse Block, 30A @ 300V

HF-003/B (5 x 20mm)
Modular Fuse Base, 15A @ 125V

1A1907-06 (6.3 x 32mm)
Tin Plated Fuse Clip, 20A @ 125V

HF-003 (5 x 20mm)
High profile with transparent cover, 6.3A @ 250V

Panel Mount Holders

HF-007 (5 x 20mm)
Finger grip knob, 10A @ 125V

HF-008 (6.3 x 32mm)
Finger grip knob, 15A @ 125V

FH-033 (5 x 20mm)
Screwdriver slot, 10A @ 125V

FH-052S (6.3 x 32mm)
Screwdriver slot, 20A @ 250V

HF-043A (5 x 20mm)
Finger grip knob, 10A @ 125V

FH-001AF (6.3 x 32mm)
Finger grip knob, 15A @ 125V

HTB-24M (5 x 20mm)
Screwdriver slot, 20A @ 250V

HKP (6.3 x 32mm)
Heavy duty finger grip, 30A @ 125V to 250V

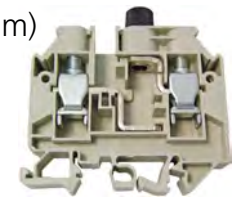
DIN Rail Holders

M205-DIN1 (5 x 20mm)
To be used with 4mm Cable, 6.3A @ 600V

3AG-DIN1 (6.3 x 32mm)
To be used with 4mm Cable, 10A @ 600V

M205-DIN1-10 (5 x 20mm)
To be used with 10mm Cable, 10A @ 600V

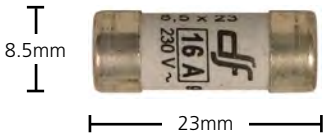
3AG-DIN1-10 (6.3 x 32mm)
To be used with 10mm Cable, 10A @ 600V



8.5mm Diameter

8.5 x 23mm

250VAC
fast (gG)

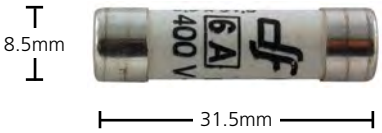


Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
400012	2A	**400018**	10A
400014	4A	**400020**	16A
400016	6A		

8.5 x 31.5mm

400VAC
fast (gG)



Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
420500	500mA	**420508**	8A
420501	1A	**420510**	10A
420502	2A	**420512**	12A
420504	4A	**420516**	16A
420506	6A	**420720**	20A

FUSE HOLDERS TO SUIT **Refer to page 27**

8.5 x 31.5mm

400VAC
slow (aM)

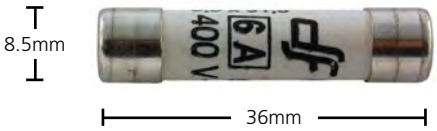
Class aM for circuits with high inrush currents.

PART NO.	AMP	PART NO.	AMP
411101	1A	**411106**	6A
411102	2A	**411108**	8A
411104	4A	**411110**	10A

FUSE HOLDERS TO SUIT **Refer to page 27**

8.5 x 36mm

400VAC
fast (gG)



Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
400038	2A	**400046**	16A
400040	4A	**400048**	20A
400042	6A	**400050**	25A
400044	10A	**400052**	32A

8.5 x 31.5mm DIN Rail Fuse Holders

PART NUMBER	DESCRIPTION	MODULE	AMP RATING	VOLTAGE RATING	PACK SIZE
485001	8.5x32 DIN Fuse Holder 1 Pole	1	25A	400V	12
485004	8.5x32 DIN Fuse Holder 2 Pole	2	25A	400V	6
485005	8.5x32 DIN Fuse Holder 3 Pole	3	25A	400V	4
485007	8.5x32 DIN Fuse Holder 4 Pole	4	25A	400V	3
WITH LED INDICATOR					
485008	8.5x32 IND. DIN Fuse Holder 1 Pole	1	25A	400V	12
485009	8.5x32 IND. DIN Fuse Holder 1+N Pole	2	25A	400V	6
485010	8.5x32 IND. DIN Fuse Holder 2 Pole	2	25A	400V	6
485011	8.5x32 IND. DIN Fuse Holder 3 Pole	3	25A	400V	4
485012	8.5x32 IND. DIN Fuse Holder 3+N Pole	4	25A	400V	3
485013	8.5x32 IND. DIN Fuse Holder 4 Pole	4	25A	400V	3
WITH NEUTRAL POLES					
485003	8.5x32 DIN Fuse Holder 1 + N Pole	2	25A	400V	6
485006	8.5x32 DIN Fuse Holder 3 + N Pole	4	25A	400V	3

10.3mm Diameter

10.3 x 26mm

240VAC*
fast (gG)

Class gG for cable and line protection.
Also used for service applications.

PART NO.	AMP	* VOLTAGE
LC2	2A	240V
LC5	5A	240V
LC8	8A	240V
LC10	10A	240V

PART NO.	AMP	* VOLTAGE
LC15	15A	240V
400026	16A	230V
LC20	20A	240V

10.3 x 31.5mm

400VAC
fast (gG)

Class gG for cable and line protection

PART NO.	AMP
400028	16A
400030	20A
400032	25A

5021006

1000VAC/DC
ultra rapid (aR)

Class aR for semiconductor protection.
Digital measuring equipment applications

PART NO.	AMP
5021006-200mA	200mA
5021006-440mA	440mA

BLS

250/600VAC
fast acting

Fast acting for general applications

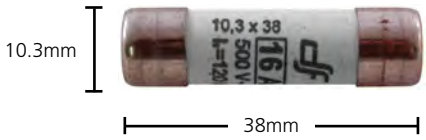
PART NO.	AMP	VOLTAGE
BLS2/10	200mA	600V
BLS4/10	400mA	600V
BLS1/2	500mA	600V
BLS3/4	750mA	600V
BLS8/10	800mA	600V
BLS1	1A	600V
BLS1-1/2	1.5A	600V
BLS1-6/10	1.6A	600V
BLS1-8/10	1.8A	600V

PART NO.	AMP	VOLTAGE
BLS2	2A	600V
BLS3	3A	600V
BLS4	4A	600V
BLS5	5A	600V
BLS6	6A	250V
BLS7	7A	250V
BLS8	8A	250V
BLS10	10A	250V

10.3 x 38mm

10.3 x 38mm

500VAC*
(250VDC)
fast (gG)



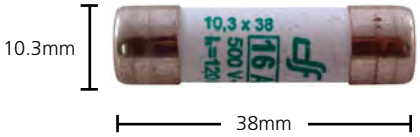
Class gG for cable and line protection

PART NO.	AMP	* VOLTAGE	PART NO.	AMP	* VOLTAGE
420000	500mA	500V	**420010**	10A	500V
420001	1A	500V	**420012**	12A	500V
420002	2A	500V	**420016**	16A	500V
420004	4A	500V	**420020**	20A	500V
420006	6A	500V	**420025**	25A	500V
420008	8A	500V	**420032**	32A	400V

FUSE HOLDERS TO SUIT **Refer to page 35**

10.3 x 38mm

500VAC*
slow (aM)



Class aM for circuits with high inrush currents

PART NO.	AMP	* VOLTAGE	PART NO.	AMP	* VOLTAGE
440031	160mA	500V	**440008**	8A	500V
440033	250mA	500V	**440010**	10A	500V
440000	500mA	500V	**440012**	12A	500V
440001	1A	500V	**440016**	16A	500V
440002	2A	500V	**440020**	20A	400V
440004	4A	500V	**440025**	25A	400V
440006	6A	500V	**J218715**	32A	400V

FUSE HOLDERS TO SUIT **Refer to page 35**

10.3 x 38mm

BLF/BLN

250VAC
fast

Fast acting for general applications

PART NO.	AMP	PART NO.	AMP
BLF1/2	500mA	**BLF7**	7A
BLF1	1A	**BLF8**	8A
BLF1-1/2	1.5A	**BLF9**	9A
BLF2	2A	**BLF10**	10A
BLF2-1/2	2.5A	**BLF12**	12A
BLF3	3A	**BLF15**	15A
BLF4	4A	**BLN20**	20A
BLF5	5A	**BLN25**	25A
BLF6	6A	**BLN30**	30A
BLF6-1/4	6.25A		

FUSE HOLDERS TO SUIT **Refer to page 34, 35**

FLM

250VAC
slow

Slow acting for circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
FLM1/10	100mA	**FLM3**	3A
FLM15/100	150mA	**FLM3-2/10**	3.2A
FLM2/10	200mA	**FLM3-1/2**	3.5A
FLM1/4	250mA	**FLM4**	4A
FLM3/10	300mA	**FLM4-1/2**	4.5A
FLM4/10	400mA	**FLM5**	5A
FLM1/2	500mA	**FLM5-6/10**	5.6A
FLM6/10	600mA	**FLM6**	6A
FLM8/10	800mA	**FLM6-1/4**	6.25A
FLM1	1A	**FLM7**	7A
FLM1-1/8	1.125A	**FLM8**	8A
FLM1-1/4	1.25A	**FLM9**	9A
FLM1-4/10	1.4A	**FLM10**	10A
FLM1-6/10	1.6A	**FLM12**	12A
FLM1-8/10	1.8A	**FLM15**	15A
FLM2	2A	**FLM20**	20A
FLM2-1/4	2.25A	**FLM25**	25A
FLM2-1/2	2.5A	**FLM30**	30A
FLM2-8/10	2.8A		

FUSE HOLDERS TO SUIT **Refer to page 34, 35**

10.3 x 38mm

FLQ

500VAC
300VDC
slow

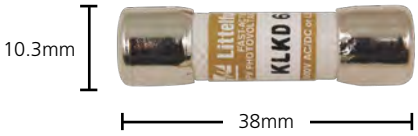
Slow acting for circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
FLQ1/10	100mA	**FLQ3**	3A
FLQ1/8	125mA	**FLQ3-2/10**	3.2A
FLQ15/100	150mA	**FLQ3-1/2**	3.5A
FLQ3/16	187mA	**FLQ4**	4A
FLQ2/10	200mA	**FLQ4-1/2**	4.5A
FLQ1/4	250mA	**FLQ5**	5A
FLQ3/10	300mA	**FLQ5-6/10**	5.6A
FLQ4/10	400mA	**FLQ6**	6A
FLQ1/2	500mA	**FLQ6-1/4**	6.25A
FLQ6/10	600mA	**FLQ7**	7A
FLQ8/10	800mA	**FLQ8**	8A
FLQ1	1A	**FLQ9**	9A
FLQ1-1/8	1.125A	**FLQ10**	10A
FLQ1-1/4	1.25A	**FLQ12**	12A
FLQ1-1/2	1.5A	**FLQ14**	14A
FLQ1-6/10	1.6A	**FLQ15**	15A
FLQ2	2A	**FLQ20**	20A
FLQ2-1/4	2.25A	**FLQ25**	25A
FLQ2-1/2	2.5A	**FLQ30**	30A

FUSE HOLDERS TO SUIT **Refer to pages 34, 35**

KLKD

600VAC/DC
fast



Fast acting for general AC and DC applications

PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
KLKD1/10	100mA	**KLKD2**	2A	**KLKD9**	9A
KLKD1/8	125mA	**KLKD2-1/2**	2.5A	**KLKD10**	10A
KLKD2/10	200mA	**KLKD3**	3A	**KLKD12**	12A
KLKD1/4	250mA	**KLKD3-1/2**	3.5A	**KLKD15**	15A
KLKD3/10	300mA	**KLKD4**	4A	**KLKD20**	20A
KLKD1/2	500mA	**KLKD5**	5A	**KLKD25**	25A
KLKD3/4	750mA	**KLKD6**	7A	**KLKD30**	30A
KLKD1	1A	**KLKD7**	6A		
KLKD1-1/2	1.5A	**KLKD8**	8A		

FUSE HOLDERS TO SUIT **Refer to pages 34, 35**

KLKR

600VAC
300VDC
fast

Fast acting (Class CC) for general applications

PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
KLKR1/10	100mA	**KLKR2**	2A	**KLKR8**	8A
KLKR1/8	125mA	**KLKR2-1/2**	2.5A	**KLKR9**	9A
KLKR2/10	200mA	**KLKR3**	3A	**KLKR10**	10A
KLKR1/4	250mA	**KLKR3-1/2**	3.5A	**KLKR12**	12A
KLKR3/10	300mA	**KLKR4**	4A	**KLKR15**	15A
KLKR1/2	500mA	**KLKR5**	5A	**KLKR20**	20A
KLKR3/4	750mA	**KLKR6**	6A	**KLKR25**	25A
KLKR1	1A	**KLKR7**	7A	**KLKR30**	30A
KLKR1-1/2	1.5A				

FUSE HOLDERS TO SUIT **Refer to pages 34, 35**

10.3 x 38mm

KLDR

600VAC
300VDC
slow

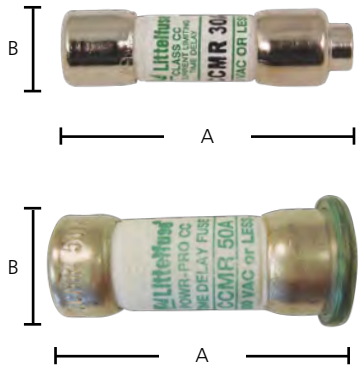
Slow acting (Class CC) for circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
KLDR1/10	100mA	**KLDR2-8/10**	2.8A
KLDR1/8	125mA	**KLDR3**	3A
KLDR15/100	150mA	**KLDR3-2/10**	3.2A
KLDR3/16	187mA	**KLDR3-1/2**	3.5A
KLDR2/10	200mA	**KLDR4**	4A
KLDR1/4	250mA	**KLDR4-1/2**	4.5A
KLDR3/10	300mA	**KLDR5**	5A
KLDR4/10	400mA	**KLDR5-6/10**	5.6A
KLDR1/2	500mA	**KLDR6**	6A
KLDR6/10	600mA	**KLDR6-1/4**	6.25A
KLDR3/4	750mA	**KLDR7**	7A
KLDR8/10	800mA	**KLDR7-1/2**	7.5A
KLDR1	1A	**KLDR8**	8A
KLDR1-1/8	1.125A	**KLDR9**	9A
KLDR1-1/4	1.25A	**KLDR10**	10A
KLDR1-4/10	1.4A	**KLDR12**	12A
KLDR1-1/2	1.5A	**KLDR15**	15A
KLDR1-6/10	1.6A	**KLDR17-1/2**	17.5A
KLDR1-8/10	1.8A	**KLDR20**	20A
KLDR2	2A	**KLDR25**	25A
KLDR2-1/4	2.25A	**KLDR30**	30A
KLDR2-1/2	2.5A		

FUSE HOLDERS TO SUIT **Refer to pages 34, 35**

CCMR

600VAC
300VDC
slow



CCMR DIMENSIONS (mm)		
AMPS	A	B
0-30	38.1	10.3
35-60	47.8	21.6

Slow acting (Class CC) for circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
CCMR2/10	200mA	**CCMR4-1/2**	4.5A
CCMR1/4	250mA	**CCMR5**	5A
CCMR3/10	300mA	**CCMR5-6/10**	5.6A
CCMR1/2	500mA	**CCMR6**	6A
CCMR6/10	600mA	**CCMR6-1/4**	6.25A
CCMR8/10	800mA	**CCMR7**	7A
CCMR1	1A	**CCMR7-1/2**	7.5A
CCMR1-1/8	1.125A	**CCMR8**	8A
CCMR1-1/4	1.25A	**CCMR9**	9A
CCMR1-4/10	1.4A	**CCMR10**	10A
CCMR1-1/2	1.5A	**CCMR12**	12A
CCMR1-6/10	1.6A	**CCMR15**	15A
CCMR1-8/10	1.8A	**CCMR17-1/2**	17.5A
CCMR2	2A	**CCMR20**	20A
CCMR2-1/4	2.25A	**CCMR25**	25A
CCMR2-1/2	2.5A	**CCMR30**	30A
CCMR2-8/10	2.8A	**CCMR35**	35A
CCMR3	3A	**CCMR40**	40A
CCMR3-2/10	3.2A	**CCMR45**	45A
CCMR3-1/2	3.5A	**CCMR50**	50A
CCMR4	4A	**CCMR60**	60A

FUSE HOLDERS TO SUIT **Refer to pages 34, 35**

10.3 x 38mm

6003305

SIBA

600VAC
ultra rapid (aR)

Class aR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
6003305-1	1A	**6003305-10**	10A
6003305-2	2A	**6003305-12**	12A
6003305-4	4A	**6003305-16**	16A
6003305-5	5A	**6003305-20**	20A
6003305-6	6A	**6003305-25**	25A
6003305-8	8A	**6003305-30**	30A

5017906

SIBA

690VAC
ultra rapid (gR)

Class gR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5017906-1	1A	**5017906-10**	10A
5017906-2	2A	**5017906-12**	12A
5017906-3	3A	**5017906-16**	16A
5017906-4	4A	**5017906-20**	20A
5017906-5	5A	**5017906-25**	25A
5017906-6	6A	**5017906-30**	30A
5017906-8	8A		

5019906

SIBA

1000VAC/DC
ultra rapid (gR)

Class gR for the protection of semiconductors.
Digital measuring equipment applications

PART NO.	AMP	PART NO.	AMP
5019906-440mA	440mA	**5019906-8**	8A
5019906-500mA	500mA	**5019906-10**	10A
5019906-1	1A	**5019906-11**	11A
5019906-2	2A	**5019906-12**	12A
5019906-3.5	3.5A	**5019906-15**	15A
5019906-4	4A	**5019906-16**	16A
5019906-6	6A		

10.3mm x Variable Length

SLC

Littelfuse

600/480VAC
medium/time delay

Class G

PART NO.	AMP	VOLTAGE	LENGTH (mm)	PART NO.	AMP	VOLTAGE	LENGTH (mm)
SLC1/2	500mA	600V	33.3	**SLC15**	15A	600V	33.3
SLC1	1A	600V	33.3	**SLC20**	20A	600V	35.7
SLC2	2A	600V	33.3	**SLC25**	25A	480V	41.3
SLC3	3A	600V	33.3	**SLC30**	30A	480V	41.3
SLC4	4A	600V	33.3	**SLC35**	35A	480V	57.2
SLC5	5A	600V	33.3	**SLC40**	40A	480V	57.2
SLC6	6A	600V	33.3	**SLC45**	45A	480V	57.2
SLC8	8A	600V	33.3	**SLC50**	50A	480V	57.2
SLC10	10A	600V	33.3	**SLC60**	60A	480V	57.2
SLC12	12A	600V	33.3				

10.3mm Diameter

FLU

1000VAC/DC
fast

Fast acting for digital measurement equipment applications

PART NO.	AMP	LENGTH (mm)
FLU44/100	440mA	35
FLU11	11A	38

10 x 38mm Fuse Holders

LETAAS-NBN (10 x 38mm)

In-Line Holder with Neutral Link,
Watertight, 30A @ 600V

LEBAAS (10 x 38mm)

In-Line Holder, Watertight,
30A @ 600V

1038-ILFH (10 x 38mm)

5AG In-Line Holder, 60A @ 32V

GPM-S (10 x 38mm)

Panel Mount, Screw Cap, 30A @ 600V

GPM-B (10 x 38mm)

Panel Mount, Bayonet Cap, 30A @ 600V

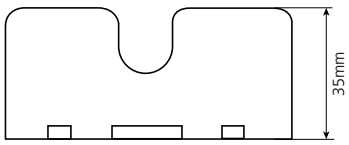
HPF-WT (10 x 38mm)

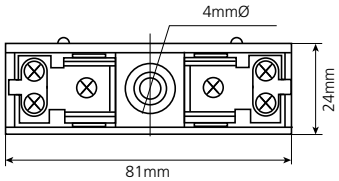
Panel Mount, Splash-proof knob, 30A @ 600V

10 x 38mm Open Base Fuse Holders

451210

Open 1P Fuse Block,
32A @ 690V





L60030M1C

Open 1P Fuse Block
Box Lug Terminals, 30A @ 600V

Contact Fuseco for Class CC fuse holders.

L60030M3C

Open 3P Fuse Block
Box Lug Terminals, 30A @ 600V

Contact Fuseco for Class CC fuse holders.

10 x 38mm DIN Rail Fuse Holders

PART NUMBER	DESCRIPTION	MODULE	AMP RATING	VOLTAGE RATING	PACK SIZE
485101	10x38 DIN Fuse Holder 1 Pole	1	32A	690V	12
485104	10x38 DIN Fuse Holder 2 Pole	2	32A	690V	6
485105	10x38 DIN Fuse Holder 3 Pole	3	32A	690V	4
485107	10x38 DIN Fuse Holder 4 Pole	4	32A	690V	3
WITH LED INDICATOR					
485108	10x38 IND. DIN Fuse Holder 1 Pole	1	32A	690V	12
485109	10x38 IND. DIN Fuse Holder 1+N Pole	2	32A	690V	6
485110	10x38 IND. DIN Fuse Holder 2 Pole	2	32A	690V	6
485111	10x38 IND. DIN Fuse Holder 3 Pole	3	32A	690V	4
485112	10x38 IND. DIN Fuse Holder 3+N Pole	4	32A	690V	3
485113	10x38 IND. DIN Fuse Holder 4 Pole	4	32A	690V	3
WITH NEUTRAL POLES					
485102	10x38 DIN Fuse Holder N Pole	1	32A	690V	12
485120	10x38 DIN Fuse Holder 1 + N Pole	1	32A	690V	12
485103	10x38 DIN Fuse Holder 1 + N Pole	2	32A	690V	6
485121	10x38 DIN Fuse Holder 3 + N Pole	3	32A	690V	4
485106	10x38 DIN Fuse Holder 3 + N Pole	4	32A	690V	3

Note For Semiconductor (Ultra Rapid) Fuses

Watts loss values of fuse and fuse holder combined must be considered if intending to use semiconductor fuses in these enclosed holders. Contact Fuseco for further advice.

Note For PV (Solar) Fuses

These holders are not suitable for use with 1000VDC PV (Solar) fuses. Refer to holders on pages 46-47.

14.3 x 51mm

NLN

250VAC/DC
fast

Fast acting (Class K-5) for general applications

PART NO.	AMP	PART NO.	AMP
NLN1	1A	**NLN8**	8A
NLN2	2A	**NLN10**	10A
NLN3	3A	**NLN12**	12A
NLN4	4A	**NLN15**	15A
NLN5	5A	**NLN20**	20A
NLN6	6A	**NLN25**	25A
NLN7	7A	**NLN30**	30A

FUSE HOLDERS TO SUIT **Refer to pages 39**

FLNR

250VAC
125VDC
slow

Slow acting (Class RK5) for circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
FLNR1/10	100mA	**FLNR3-2/10**	3.2A
FLNR1/8	125mA	**FLNR3-1/2**	3.5A
FLNR15/100	150mA	**FLNR4**	4A
FLNR2/10	200mA	**FLNR4-1/2**	4.5A
FLNR3/10	300mA	**FLNR5**	5A
FLNR4/10	400mA	**FLNR5-6/10**	5.6A
FLNR1/2	500mA	**FLNR6**	6A
FLNR6/10	600mA	**FLNR6-1/4**	6.25A
FLNR8/10	800mA	**FLNR7**	7A
FLNR1	1A	**FLNR7-1/2**	7.5A
FLNR1-1/8	1.125A	**FLNR8**	8A
FLNR1-1/4	1.25A	**FLNR9**	9A
FLNR1-4/10	1.4A	**FLNR10**	10A
FLNR1-6/10	1.6A	**FLNR12**	12A
FLNR1-8/10	1.8A	**FLNR15**	15A
FLNR2	2A	**FLNR17-1/2**	17.5A
FLNR2-1/4	2.25A	**FLNR20**	20A
FLNR2-1/2	2.5A	**FLNR25**	25A
FLNR2-8/10	2.8A	**FLNR30**	30A
FLNR3	3A		

FUSE HOLDERS TO SUIT **Refer to pages 39**

14.3 x 51mm

14.3 x 51mm

690VAC*
fast (gG)

Class gG for general applications

PART NO.	AMP	* VOLTAGE
421001	1A	690V
421002	2A	690V
421004	4A	690V
421006	6A	690V
421008	8A	690V
421010	10A	690V
421012	12A	690V

PART NO.	AMP	* VOLTAGE
421016	16A	690V
421020	20A	690V
421025	25A	690V
421032	32A	500V
421040	40A	500V
421050	50A	400V

FUSE HOLDERS TO SUIT **Refer to pages 39**

14.3 x 51mm

690VAC*
slow (aM)

Class aM for circuits with high inrush currents

PART NO.	AMP	* VOLTAGE
441031	250mA	690V
441000	500mA	690V
441001	1A	690V
441002	2A	690V
441004	4A	690V
441006	6A	690V
441008	8A	690V
441010	10A	690V

PART NO.	AMP	* VOLTAGE
441012	12A	690V
441016	16A	690V
441020	20A	690V
441025	25A	690V
441032	32A	500V
441040	40A	500V
441045	45A	500V
441050	50A	400V

FUSE HOLDERS TO SUIT **Refer to pages 39**

1451F

415VAC
service fuse

Fast acting for service applications. British Standard

PART NO.	AMP
1451F-10	10A
1451F-16	16A
1451F-20	20A
1451F-25	25A
1451F-32	32A

PART NO.	AMP
1451F-40	40A
1451F-45	45A
1451F-50	50A
1451F-55	55A

L50S

500VAC
450VDC
ultra rapid

Ultra rapid for semiconductor applications

PART NO.	AMP
L50S-10	10A
L50S-15	15A
L50S-20	20A

PART NO.	AMP
L50S-25	25A
L50S-30	30A

FUSE HOLDERS TO SUIT **Refer to pages 39**

14.3 x 51mm

A70QS-14F

700VAC
ultra rapid

Ultra rapid for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
A70QS10-14F	10A	**A70QS25-14F**	25A
A70QS12-14F	12A	**A70QS32-14F**	32A
A70QS16-14F	16A	**A70QS40-14F**	40A
A70QS20-14F	20A	**A70QS50-14F**	50A

L70S

700VAC
650VDC
ultra rapid

Ultra rapid for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
L70S10-1	10A	**L70S25-1**	25A
L70S15-1	15A	**L70S30-1**	30A
L70S20-1	20A		

5012606

690VAC (IEC)
700VAC (UL)
ultra rapid (gR)

Class gR (with striker) for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5012606-1	1A	**5012606-16**	16A
5012606-2	2A	**5012606-20**	20A
5012606-4	4A	**5012606-25**	25A
5012606-6	6A	**5012606-32**	32A
5012606-8	8A	**5012606-40**	40A
5012606-10	10A	**5012606-50**	50A
5012606-12	12A		

5011806

700VDC
ultra rapid (aR)

Class aR for the protection of semiconductors in DC circuits

PART NO.	AMP	PART NO.	AMP
5011806-6	6A	**5011806-25**	25A
5011806-8	8A	**5011806-30**	30A
5011806-10	10A	**5011806-35**	35A
5011806-12	12A	**5011806-40**	40A
5011806-16	16A	**5011806-50**	50A
5011806-20	20A		

14.3 x 51mm DIN Rail Fuse Holders

PART NUMBER	DESCRIPTION	MODULE	AMP RATING	VOLTAGE RATING	PACK SIZE
485201	14x51 DIN Fuse Holder 1 Pole	1.5	50A	690V	6
485204	14x51 DIN Fuse Holder 2 Pole	3	50A	690V	3
485205	14x51 DIN Fuse Holder 3 Pole	4.5	50A	690V	2
485207	14x51 DIN Fuse Holder 4 Pole	6	50A	690V	1
WITH LED INDICATOR					
485208	14x51 IND. DIN Fuse Holder 1 Pole	1.5	50A	690V	6
485209	14x51 IND. DIN Fuse Holder 1+N Pole	3	50A	690V	3
485210	14x51 IND. DIN Fuse Holder 2 Pole	3	50A	690V	3
485211	14x51 IND. DIN Fuse Holder 3 Pole	4.5	50A	690V	2
485212	14x51 IND. DIN Fuse Holder 3+N Pole	6	50A	690V	1
485213	14x51 IND. DIN Fuse Holder 4 Pole	6	50A	690V	1
WITH MICROSWITCH					
485220	14x51 MS DIN Fuse Holder 1 Pole	1.5	50A	690V	6
485223	14x51 MS DIN Fuse Holder 3 Pole	4.5	50A	690V	2
485224	14x51 MS DIN Fuse Holder 3+N Pole	6	50A	690V	1
485226	14x51 MS DIN Fuse Holder 1 Pole (only fusing)	1.5	50A	690V	6
485229	14x51 MS DIN Fuse Holder 3 Pole (only fusing)	4.5	50A	690V	2
485230	14x51 MS DIN Fuse Holder 3+N Pole (only fusing)	6	50A	690V	1
WITH NEUTRAL POLES					
485202	14x51 DIN Fuse Holder N Pole	1.5	50A	690V	6
485203	14x51 DIN Fuse Holder 1 + N Pole	3	50A	690V	3
485206	14x51 DIN Fuse Holder 3 + N Pole	6	50A	690V	1

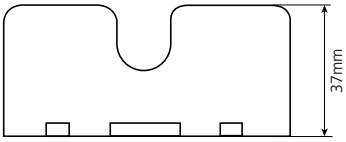
Note For Semiconductor (Ultra Rapid) Fuses

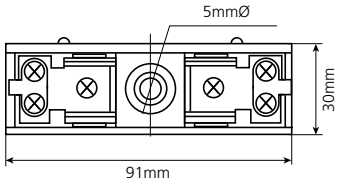
Watts loss values of fuse and fuse holder combined must be considered if intending to use semiconductor fuses in these enclosed holders.
Contact Fuseco for further advice.

14.3 x 51mm Open Base Fuse Holders

451220

Open 1P Fuse Block,
50A @ 690V





Various Cartridge Fuses

NATO Series

440VAC
fast

Fast acting for NATO applications

PART NO.	AMP	A(mm)	B(mm)
059-0140	0.5A	12	33.6
059-0141	1A	12	33.6
059-0142	2A	12	33.6
059-0143	3A	12	33.6
059-0144	5A	12	33.6
059-0145	7A	12	33.6
059-0146	10A	12	33.6
059-0147	15A	12	33.6
011-9483	20A	12	33.6

PART NO.	AMP	A(mm)	B(mm)
059-0148	10A	16.7	38
059-0149	15A	16.7	38
059-0150	20A	16.7	38
059-0151	30A	16.7	38
059-0152	40A	33	48
059-0153	60A	33	48
059-0154	80A	33	48
059-0155	100A	33	48

MD

415VAC
service fuse

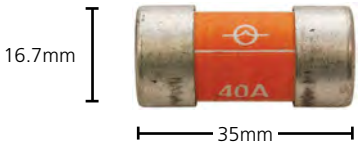
Fast acting for general and service applications

PART NO.	AMP
MD2	2A
MD4	4A
MD6	6A
MD8	8A
MD10	10A
MD16	16A

PART NO.	AMP
MD20	20A
MD25	25A
MD32	32A

LK

415VAC
service fuse

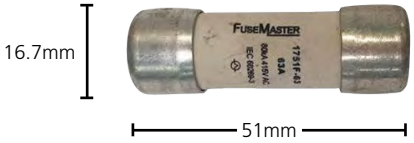


Fast acting for general and service applications

PART NO.	AMP
LK35	35A
LK40	40A
LK45	45A

1751F

415VAC
service fuse



Fast acting for general and service applications

PART NO.	AMP
1751F-45	45A
1751F-63	63A

20 x 76mm Service Fuse

2076F

FuseMaster

415VAC
service fuse

Fast acting for service applications, cable and line protection

PART NO.	AMP
2076F-20	20A
2076F-32	32A
2076F-63	63A

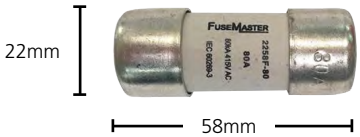
PART NO.	AMP
2076F-80	80A
2076F-100	100A

22 x 58mm Service Fuse

2258F

FuseMaster

415VAC
service fuse



Fast acting for service applications, cable and line protection

PART NO.	AMP
2258F-20	20A
2258F-25	25A
2258F-32	32A
2258F-40	40A
2258F-45	45A

PART NO.	AMP
2258F-50	50A
2258F-63	63A
2258F-80	80A
2258F-100	100A

22 x 58mm Service Fuse Holder

SFH Series

FuseMaster

500VAC

PART NO.	DESCRIPTION
SFH22FW	Front Wired to suit 2258F Service Fuses
SFH22BW	Back Wired to suit 2258F Service Fuses
SFH22BW-C/S	Back Wired with Cheeseslot to suit 2258F Service Fuses
SFH22BW-Q	Back Wired with 22x58 Neutral Link
SFH22BW-Q-C/S	Back Wired with 22x58 Neutral Link and Cheeseslot
SFH22WFB	Wired Front & Back to suit 2258F Service Fuses

22 x 58mm

22 x 58mm

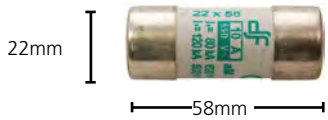
690VAC*
fast (gG)

Class gG for cable and line protection

PART NO.	AMP	* VOLTAGE	PART NO.	AMP	* VOLTAGE
422002	2A	690V	**422025**	25A	690V
422004	4A	690V	**422032**	32A	690V
422006	6A	690V	**422040**	40A	690V
422008	8A	690V	**422050**	50A	690V
422010	10A	690V	**422063**	63A	690V
422012	12A	690V	**422080**	80A	500V
422016	16A	690V	**422000**	100A	500V
422020	20A	690V	**422015**	125A	400V

22 x 58mm

690VAC*
slow (aM)

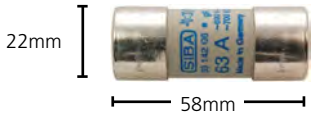


Class aM for circuits with high inrush currents

PART NO.	AMP	* VOLTAGE	PART NO.	AMP	* VOLTAGE
442002	2A	690V	**442025**	25A	690V
442004	4A	690V	**442032**	32A	690V
442006	6A	690V	**442040**	40A	690V
442008	8A	690V	**442050**	50A	690V
442010	10A	690V	**442063**	63A	690V
442012	12A	690V	**442080**	80A	500V
442016	16A	690V	**442000**	100A	500V
442020	20A	690V	**442015**	125A	400V

5014206

690VAC
ultra rapid (gR)



Class gR with striker for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5014206-12	12A	**5014206-50**	50A
5014206-16	16A	**5014206-63**	63A
5014206-20	20A	**5014206-80**	80A
5014206-25	25A	**5014206-100**	100A
5014206-32	32A	**5014206-125**	125A
5014206-40	40A	**5014206-135**	135A

A70QS-22F

700VAC/DC
ultra rapid

Ultra rapid for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
A70QS20-22F	20A	**A70QS50-22F**	50A
A70QS25-22F	25A	**A70QS63-22F**	63A
A70QS32-22F	32A	**A70QS80-22F**	80A
A70QS40-22F	40A	**A70QS100-22F**	100A

FUSE HOLDERS TO SUIT **Refer to pages 43**

22 x 58mm DIN Rail Fuse Holders

PART NUMBER	DESCRIPTION	MODULE	AMP RATING	VOLTAGE RATING	PACK SIZE
485301	22x58 DIN Fuse Holder 1 Pole	2	125A	690V	6
485304	22x58 DIN Fuse Holder 2 Pole	4	125A	690V	3
485305	22x58 DIN Fuse Holder 3 Pole	6	125A	690V	2
485307	22x58 DIN Fuse Holder 4	8	125A	690V	1
WITH LED INDICATOR					
485308	22x58 IND DIN Fuse Holder 1 Pole	2	125A	690V	6
485309	22x58 IND DIN Fuse Holder 1+N Pole	4	125A	690V	3
485310	22x58 IND DIN Fuse Holder 2 Pole	4	125A	690V	3
485311	22x58 IND DIN Fuse Holder 3 Pole	6	125A	690V	2
485312	22x58 IND DIN Fuse Holder 3+N Pole	8	125A	690V	1
485313	22x58 IND DIN Fuse Holder 4 pole	8	125A	690V	1
WITH MICROSWITCH					
485320	22x58 MS DIN Fuse Holder 1 Pole	2	125A	690V	6
485323	22x58 MS DIN Fuse Holder 3 Pole	6	125A	690V	2
485324	22x58 MS DIN Fuse Holder 3+N Pole	8	125A	690V	1
WITH NEUTRAL POLES					
485302	22x58 DIN Fuse Holder N Pole	2	125A	690V	6
485303	22x58 DIN Fuse Holder 1+N Pole	4	125A	690V	3
485306	22x58 DIN Fuse Holder 3+N Pole	8	125A	690V	1

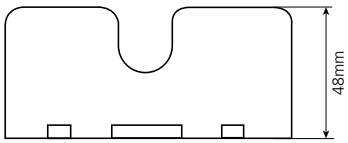
Note For Semiconductor (Ultra Rapid) Fuses

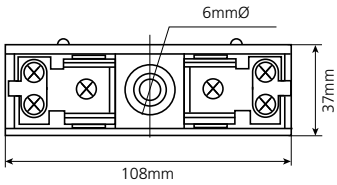
Watts loss values of fuse and fuse holder combined must be considered if intending to use semiconductor fuses in these enclosed holders. Contact Fuseco for further advice.

22 x 58mm Open Base Fuse Holders

451230

Open 1P Fuse Block,
100A @ 690V





FP Series Fuse Pullers

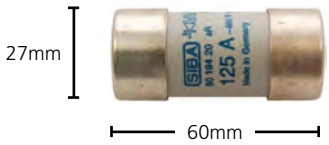
PART NO.	DESCRIPTION
FP-A3	Glass tube and MINI / AUTO fuses
FP-2	10.3 to 21mm diameter fuses
FP-3	25.4 to 44.5mm diameter fuses
FP-4	44.5 to 63.5mm diameter fuses
FP-6	0-60A JLLN and JLLS fuses

27 x 60mm

5019420

SIBA

660VAC
ultra rapid (aR)
with striker



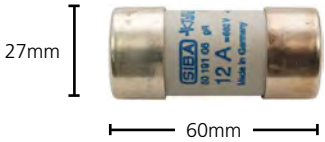
Type aR (with striker) for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
5019420-20	20A	**5019420-100**	100A
5019420-25	25A	**5019420-125**	125A
5019420-32	32A	**5019420-160**	160A
5019420-40	40A	**5019420-200**	200A
5019420-50	50A	**5019420-250**	250A
5019420-63	63A		

5019106

SIBA

660VDC*
ultra rapid (gR)
with striker



Type gR (with striker) for the protection of semiconductors

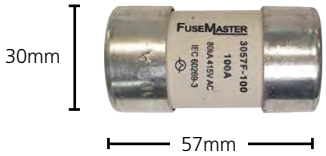
PART NO.	AMP	* VOLTAGE	PART NO.	AMP	* VOLTAGE
5019106-8	8A	660V	**5019106-50**	50A	660V
5019106-10	10A	660V	**5019106-63**	63A	660V
5019106-12	12A	660V	**5019106-80**	80A	660V
5019106-16	16A	660V	**5019106-100**	100A	660V
5019106-20	20A	660V	**5019106-110**	110A	660V
5019106-25	25A	660V	**5019106-125**	125A	440V
5019106-32	32A	660V	**5019106-160**	160A	440V
5019106-40	40A	660V			

30 x 57mm Service Fuse

3057F

FUSEMASTER

415VAC
service fuse



Fast acting for service applications, cable and line protection

PART NO.	AMP	PART NO.	AMP
3057F-32	32A	**3057F-63**	63A
3057F-40	40A	**3057F-80**	80A
3057F-50	50A	**3057F-100**	100A

30 x 57mm Service Fuse Holder

SFH Series

FUSEMASTER

PART NO.	DESCRIPTION
SFH30FW-AI	Front Wired with anti-intrusion feature to suit 3057F Service Fuses
SFH30BW-AI	Back Wired with anti-intrusion feature to suit 3057F Service Fuses

Various Cartridge Fuses

9008210

1000VDC
ultra rapid (gR)

Class gR (with striker) for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
9008210-6	6A	**9008210-25**	25A
9008210-8	8A	**9008210-32**	32A
9008210-10	10A	**9008210-40**	40A
9008210-12	12A	**9008210-50**	50A
9008210-16	16A	**9008210-63**	63A
9008210-20	20A		

FUSE HOLDERS TO SUIT **9108001 (Disconnect switch)**

9008110

1500VDC
ultra rapid (gR)

Class gR (with striker) for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
9008110-5	5A	**9008110-12**	12A
9008110-6	6A	**9008110-16**	16A
9008110-8	8A	**9008110-20**	20A
9008110-10	10A	**9008110-25**	25A

FUSE HOLDERS TO SUIT **9108001 (Disconnect switch)**

9009010

1500VDC
ultra rapid (gR)

Class gR for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
9009010-6	6A	**9009010-16**	16A
9009010-8	8A	**9009010-20**	20A
9009010-10	10A	**9009010-25**	25A
9009010-12	12A	**9009010-32**	32A

FUSE HOLDERS TO SUIT **Contact Fuseco**

9009510

1500VDC
ultra rapid (gR)

Class gR with striker for the protection of semiconductors

PART NO.	AMP	PART NO.	AMP
9009510-20	20A	**9009510-50**	50A
9009510-25	25A	**9009510-63**	63A
9009510-32	32A	**9009510-80**	80A
9009510-40	40A	**9009510-100**	100A

FUSE HOLDERS TO SUIT **Contact Fuseco**

10 x 38mm gPV Fuses & Holders

SPF

1000VDC
gPV

Specialised class gPV for solar applications

PART NO.	AMP	PART NO.	AMP
SPF1	1A	**SPF8**	8A
SPF2	2A	**SPF10**	10A
SPF3	3A	**SPF12**	12A
SPF3.5	3.5A	**SPF15**	15A
SPF4	4A	**SPF20**	20A
SPF5	5A	**SPF25**	25A
SPF6	6A	**SPF30**	30A

LPHV Series

1000VDC

PART NO.	DESCRIPTION	TO SUIT	VOTTAGE RATING
LPHV0001Z	1-Pole 32A	10 x 38mm PV Fuse	1000VDC
LPHV0002Z	2-Pole 32A	10 x 38mm PV Fuse	1000VDC

4916 Series

1000VDC
gPV

Specialised class gPV for solar applications

PART NO.	AMP	PART NO.	AMP
491601	1A	**491615**	8A
491602	2A	**491620**	10A
491604	3A	**491625**	12A
491605	4A	**491629**	15A
491606	5A	**491630**	16A
491610	6A	**491635**	20A

4851 Series

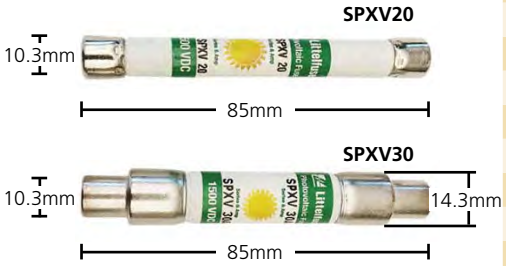
1000VDC

PART NO.	DESCRIPTION	TO SUIT	VOLTAGE RATING
485150	1-Pole 32A	10 x 38mm PV Fuse	1000VDC
485151	2-Pole 32A	10 x 38mm PV Fuse	1000VDC

10/14 x 85mm gPV Fuses & Holders

SPXV Series

1500VDC
gPV



Specialised class gPV for solar applications

PART NO.	AMP	CAP / BODY DIAMETER
SPXV1	1A	10mm
SPXV2	2A	10mm
SPXV2.25	2.25A	10mm
SPXV2.5	2.5A	10mm
SPXV3	3A	10mm
SPXV3.5	3.5A	10mm
SPXV4	4A	10mm
SPXV5	5A	10mm
SPXV6	6A	10mm
SPXV8	8A	10mm

PART NO.	AMP	CAP / BODY DIAMETER
SPXV10	10A	10mm
SPXV12	12A	10mm
SPXV15	15A	10mm
SPXV16	16A	10mm
SPXV20	20A	10mm
SPXV25	25A	10mm / 14mm
SPXV25-M	25A	10mm
SPXV30	30A	10mm / 14mm
SPXV30-M	30A	10mm
SPXV32-M	32A	10mm

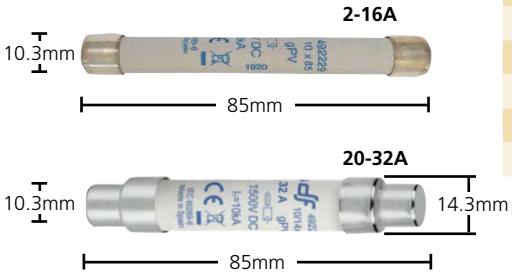
LFPXV001 Holder

1500VDC

PART NO.	DESCRIPTION	TO SUIT	VOLTAGE RATING
LFPXV001	1-Pole 32A	10/14 x 85mm PV Fuse	1500VDC

4922 Series

1500VDC
gPV



Specialised class gPV for solar applications

PART NO.	AMP	CAP / BODY DIAMETER
492202	2A	10mm
492205	4A	10mm
492210	6A	10mm
492215	8A	10mm
492220	10A	10mm
492225	12A	10mm

PART NO.	AMP	CAP / BODY DIAMETER
492229	15A	10mm
492230	16A	10mm
492250	20A	10mm / 14mm
492255	25A	10mm / 14mm
492260	30A	10mm / 14mm
492262	32A	10mm / 14mm

485701 Holder

1500VDC

PART NO.	DESCRIPTION	TO SUIT	VOLTAGE RATING
485701	1-Pole 32A	10/14 x 85mm PV Fuse	1500VDC

22x65mm gPV Fuses & Holders

49227 Series

1500VDC
gPV

Specialised class gPV for solar applications

PART NO.	AMP
492270	40A
492275	50A

5026028

1500VDC
gPV

Specialised class gPV for solar applications

PART NO.	AMP
5026028-40	40A
5026028-50	50A

485720 Holder

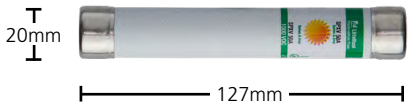
1500VDC

PART NO.	DESCRIPTION	TO SUIT	VOLTAGE RATING
485720	1-Pole 100A	22 x 65mm PV Fuse	1500VDC

20x127mm gPV Fuses & Holders

SPXV 127mm Series

1500VDC
gPV



PART NO.	AMP
SPXV35	35A
SPXV40	40A
SPXV45	45A

PART NO.	AMP
SPXV50	50A
SPXV55	55A
SPXV60	60A

LFXV15060-BC Holder

1500VDC

PART NO.	DESCRIPTION	TO SUIT	VOLTAGE RATING
LFXV15060-BC	1-Pole 60A	20 x 127mm PV Fuse	1500VDC

FuseMaster NH Fuses

NH00F
NH000F

500VAC (250VDC)
fast (gG)

DIMENSIONS (mm) REFER TO DIAGRAM BELOW					
AMP	Size	A	B	C	D
4-100	00C	49	78	40	21
125-160	00	49	78	48	30

Class gG for solar battery protection

PART NO.	SIZE	AMP
NH000F-2	00C	2
NH000F-4	00C	4
NH000F-6	00C	6
NH000F-10	00C	10
NH000F-16	00C	16
NH000F-20	00C	20
NH000F-25	00C	25
NH000F-32	00C	32
NH000F-35	00C	35
NH000F-40	00C	40
NH000F-50	00C	50
NH000F-63	00C	63
NH000F-80	00C	80
NH000F-100	00C	100
NH00F-125	00	125
NH00F-160	00	160

FUSE HOLDERS TO SUIT **Refer to page 51**

NH1F

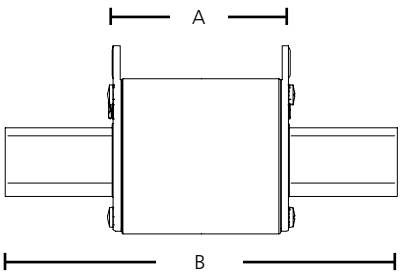
500VAC (440VDC)
fast (gG)

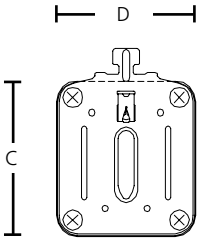
DIMENSIONS (mm) REFER TO DIAGRAM BELOW					
AMP	Size	A	B	C	D
16-160	1C	65	135	46	28
200-250	1	65	135	46	46

Class gG for solar battery protection

PART NO.	SIZE	AMP
NH1F-16	1C	16
NH1F-20	1C	20
NH1F-25	1C	25
NH1F-32	1C	32
NH1F-35	1C	35
NH1F-40	1C	40
NH1F-50	1C	50
NH1F-63	1C	63
NH1F-80	1C	80
NH1F-100	1C	100
NH1F-125	1C	125
NH1F-160	1C	160
NH1F-200	1	200
NH1F-224	1	224
NH1F-250	1	250

FUSE HOLDERS TO SUIT **Refer to page 51**





FuseMaster NH Fuses

NH2F

FuseMaster

500VAC (440VDC)
fast (gG)

DIMENSIONS (mm) REFER TO DIAGRAM BELOW					
AMP	Size	A	B	C	D
35-160	2CC	65	150	46	28
200-250	2C	65	150	47.5	47.5
300-400	2	65	150	56	56.5

Class gG for solar battery protection

PART NO.	SIZE	AMP
NH2F-35	2CC	35
NH2F-40	2CC	40
NH2F-50	2CC	50
NH2F-63	2CC	63
NH2F-80	2CC	80
NH2F-100	2CC	100
NH2F-125	2CC	125
NH2F-160	2CC	160
NH2F-200	2C	200
NH2F-224	2C	224
NH2F-250	2C	250
NH2F-315	2	315
NH2F-355	2	355
NH2F-400	2	400

FUSE HOLDERS TO SUIT **Refer to page 51**

NH3F

FuseMaster

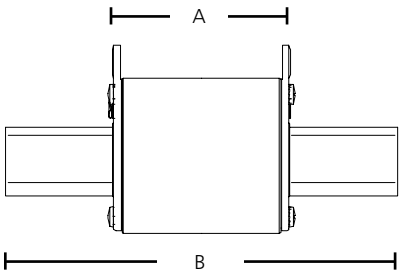
500VAC (440VDC)
fast (gG)

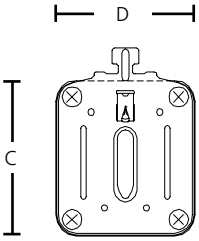
DIMENSIONS (mm) REFER TO DIAGRAM BELOW					
AMP	Size	A	B	C	D
315-400	3C	68	150	56.5	57
425-630	3	68	150	66.5	67

Class gG for solar battery protection

PART NO.	SIZE	AMP
NH3F-315	3C	315
NH3F-355	3C	355
NH3F-400	3C	400
NH3F-425	3	425
NH3F-500	3	500
NH3F-630	3	630

FUSE HOLDERS TO SUIT **Refer to page 51**





Disconnect Switches

690VAC

FuseMaster

df Electric

NH00-3DS

335040

PART NO.	TO SUIT FUSE SIZE	POLE	DESCRIPTION	PACK QTY
335005	000	3	Triple Pole 100A Disconnect Switch	1
335040	00/000	3	Triple Pole 160A Disconnect Switch with Busbar	1
NH00-3DS	00/000	3	Triple Pole 160A Disconnect Switch	1
NH1-3DS	1	3	Triple Pole 250A Disconnect Switch	1
NH2-3DS	2	3	Triple Pole 400A Disconnect Switch	1
NH3-3DS	3	3	Triple Pole 630A Disconnect Switch	1

Note For Semiconductor (Ultra Rapid) Fuses

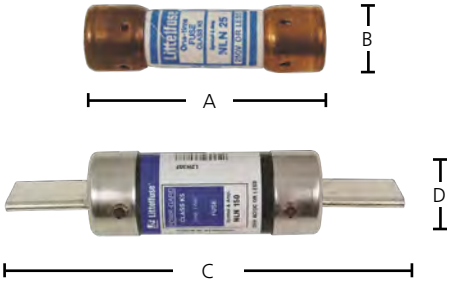
Watts loss values of fuse and fuse holder combined must be considered if intending to use semiconductor fuses in these enclosed holders.
Contact Fuseco for further advice.

Industrial Class K-5

NLN

Littelfuse

250VAC/DC
fast



NLN DIMENSIONS (mm)				
AMPS	A	B	C	D
1-30	51	14		
35-60	76	21		
65-100			149	27
110-200			181	40
225-400			219	53
450-600			264	66

Fast acting for general purpose applications

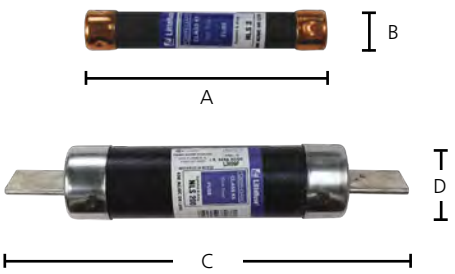
PART NO.	AMP	PART NO.	AMP
NLN1	1A	**NLN60**	60A
NLN2	2A	**NLN70**	70A
NLN3	3A	**NLN80**	80A
NLN4	4A	**NLN90**	90A
NLN5	5A	**NLN100**	100A
NLN6	6A	**NLN110**	110A
NLN7	7A	**NLN125**	125A
NLN8	8A	**NLN150**	150A
NLN10	10A	**NLN175**	175A
NLN12	12A	**NLN200**	200A
NLN15	15A	**NLN225**	225A
NLN20	20A	**NLN250**	250A
NLN25	25A	**NLN300**	300A
NLN30	30A	**NLN350**	350A
NLN35	35A	**NLN400**	400A
NLN40	40A	**NLN450**	450A
NLN45	45A	**NLN500**	500A
NLN50	50A	**NLN600**	600A

FUSE HOLDERS TO SUIT **Refer to page 61**

NLS

Littelfuse

600VAC
fast



NLS DIMENSIONS (mm)				
AMPS	A	B	C	D
1-30	127	21		
35-60	139	27		
65-100			200	34
110-200			244	46
225-400			295	66
450-600			340	80

Fast acting for general purpose applications

PART NO.	AMP	PART NO.	AMP
NLS1	1A	**NLS60**	60A
NLS2	2A	**NLS70**	70A
NLS3	3A	**NLS80**	80A
NLS4	4A	**NLS90**	90A
NLS5	5A	**NLS100**	100A
NLS6	6A	**NLS110**	110A
NLS7	7A	**NLS125**	125A
NLS8	8A	**NLS150**	150A
NLS10	10A	**NLS175**	175A
NLS12	12A	**NLS200**	200A
NLS15	15A	**NLS225**	225A
NLS20	20A	**NLS250**	250A
NLS25	25A	**NLS300**	300A
NLS30	30A	**NLS350**	350A
NLS35	35A	**NLS400**	400A
NLS40	40A	**NLS450**	450A
NLS45	45A	**NLS500**	500A
NLS50	50A	**NLS600**	600A

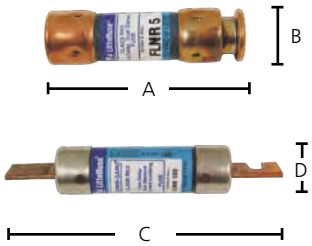
FUSE HOLDERS TO SUIT **Refer to page 61**

Industrial Class RK5

FLNR

Littelfuse

250VAC
slow



FLNR DIMENSIONS (mm)				
AMPS	A	B	C	D
1-30	51	14		
35-60	76	21		
70-100			149	27
110-200			181	40
225-400			219	53
450-600			264	66

Slow acting for motor circuit protection

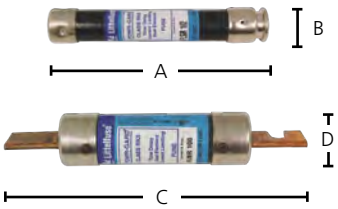
PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
FLNR1/10	100MA	**FLNR3-2/10**	3.2A	**FLNR50**	50A
FLNR1/8	125MA	**FLNR3-1/2**	3.5A	**FLNR60**	60A
FLNR15/100	150MA	**FLNR4**	4A	**FLNR70**	70A
FLNR2/10	200MA	**FLNR4-1/2**	4.5A	**FLNR75**	75A
FLNR1/4	250MA	**FLNR5**	5A	**FLNR80**	80A
FLNR3/10	300MA	**FLNR5-6/10**	5.6A	**FLNR90**	90A
FLNR4/10	400MA	**FLNR6**	6A	**FLNR100**	100A
FLNR1/2	500MA	**FLNR6-1/4**	6.25A	**FLNR110**	110A
FLNR6/10	600MA	**FLNR7**	7A	**FLNR125**	125A
FLNR8/10	800MA	**FLNR7-1/2**	7.5A	**FLNR150**	150A
FLNR1	1A	**FLNR8**	8A	**FLNR175**	175A
FLNR1-1/8	1.125A	**FLNR9**	9A	**FLNR200**	200A
FLNR1-1/4	1.25A	**FLNR10**	10A	**FLNR225**	225A
FLNR1-4/10	1.4A	**FLNR12**	12A	**FLNR250**	250A
FLNR1-1/2	1.5A	**FLNR15**	15A	**FLNR300**	300A
FLNR1-6/10	1.6A	**FLNR17-1/2**	17.5A	**FLNR350**	350A
FLNR1-8/10	1.8A	**FLNR20**	20A	**FLNR400**	400A
FLNR2	2A	**FLNR25**	25A	**FLNR450**	450A
FLNR2-1/4	2.25A	**FLNR30**	30A	**FLNR500**	500A
FLNR2-1/2	2.5A	**FLNR35**	35A	**FLNR600**	600A
FLNR2-8/10	2.8A	**FLNR40**	40A		
FLNR3	3A	**FLNR45**	45A		

FUSE HOLDERS TO SUIT **Refer to page 61**

FLSR

Littelfuse

600VAC
slow



FLSR DIMENSIONS (mm)				
AMPS	A	B	C	D
1-30	127	21		
35-60	139	27		
70-100			200	34
110-200			244	46
225-400			295	66
450-600			340	80

Slow acting for motor circuit protection

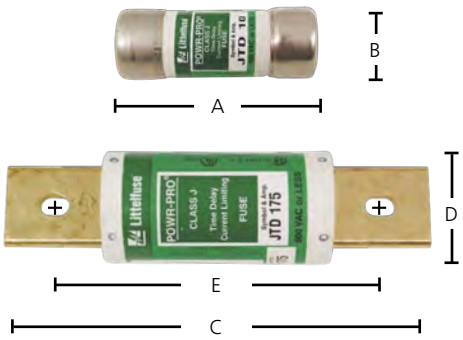
PART NO.	AMP	PART NO.	AMP	PART NO.	AMP
FLSR1/10	100MA	**FLSR3-2/10**	3.2A	**FLSR50**	50A
FLSR1/8	125MA	**FLSR3-1/2**	3.5A	**FLSR60**	60A
FLSR15/100	150MA	**FLSR4**	4A	**FLSR70**	70A
FLSR2/10	200MA	**FLSR4-1/2**	4.5A	**FLSR75**	75A
FLSR1/4	250MA	**FLSR5**	5A	**FLSR80**	80A
FLSR3/10	300MA	**FLSR5-6/10**	5.6A	**FLSR90**	90A
FLSR4/10	400MA	**FLSR6**	6A	**FLSR100**	100A
FLSR1/2	500MA	**FLSR6-1/4**	6.25A	**FLSR110**	110A
FLSR6/10	600MA	**FLSR7**	7A	**FLSR125**	125A
FLSR8/10	800MA	**FLSR7-1/2**	7.5A	**FLSR150**	150A
FLSR1	1A	**FLSR8**	8A	**FLSR175**	175A
FLSR1-1/8	1.125A	**FLSR9**	9A	**FLSR200**	200A
FLSR1-1/4	1.25A	**FLSR10**	10A	**FLSR225**	225A
FLSR1-4/10	1.4A	**FLSR12**	12A	**FLSR250**	250A
FLSR1-1/2	1.5A	**FLSR15**	15A	**FLSR300**	300A
FLSR1-6/10	1.6A	**FLSR17-1/2**	17.5A	**FLSR350**	350A
FLSR1-8/10	1.8A	**FLSR20**	20A	**FLSR400**	400A
FLSR2	2A	**FLSR25**	25A	**FLSR450**	450A
FLSR2-1/4	2.25A	**FLSR30**	30A	**FLSR500**	500A
FLSR2-1/2	2.5A	**FLSR35**	35A	**FLSR600**	600A
FLSR2-8/10	2.8A	**FLSR40**	40A		
FLSR3	3A	**FLSR45**	45A		

FUSE HOLDERS TO SUIT **Refer to page 61**

Industrial Class J

JTD

600VAC
slow



Slow acting for circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
JTD8/10	800MA	**JTD20**	20A
JTD1	1A	**JTD25**	25A
JTD1-1/4	1.25A	**JTD30**	30A
JTD1-1/2	1.5A	**JTD35**	35A
JTD1-6/10	1.6A	**JTD40**	40A
JTD1-8/10	1.8A	**JTD45**	45A
JTD2	2A	**JTD50**	50A
JTD2-1/4	2.25A	**JTD60**	60A
JTD2-1/2	2.5A	**JTD70**	70A
JTD2-8/10	2.8A	**JTD80**	80A
JTD3	3A	**JTD90**	90A
JTD3-2/10	3.2A	**JTD100**	100A
JTD3-1/2	3.5A	**JTD110**	110A
JTD4	4A	**JTD125**	125A
JTD4-1/2	4.5A	**JTD150**	150A
JTD5	5A	**JTD175**	175A
JTD5-6/10	5.6A	**JTD200**	200A
JTD6	6A	**JTD225**	225A
JTD7	7A	**JTD250**	250A
JTD8	8A	**JTD300**	300A
JTD9	9A	**JTD350**	350A
JTD10	10A	**JTD400**	400A
JTD12	12A	**JTD450**	450A
JTD15	15A	**JTD500**	500A
JTD17-1/2	17.5A	**JTD600**	600A

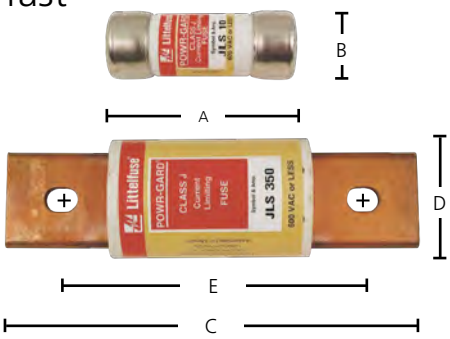
FUSE HOLDERS TO SUIT **Refer to page 61**

JTD DIMENSIONS (mm)

AMPS	A	B	C	D	E
1-30	57	21			
35-60	60	27			
70-100			117	29	92
110-200			146	38	111
225-400			181	51	133
450-600			203	64	152

JLS

600VAC
fast



Fast acting for general purpose applications

PART NO.	AMP	PART NO.	AMP
JLS1	1A	**JLS90**	90A
JLS3	3A	**JLS100**	100A
JLS6	6A	**JLS110**	110A
JLS10	10A	**JLS125**	125A
JLS15	15A	**JLS150**	150A
JLS20	20A	**JLS175**	175A
JLS25	25A	**JLS200**	200A
JLS30	30A	**JLS225**	225A
JLS35	35A	**JLS250**	250A
JLS40	40A	**JLS300**	300A
JLS45	45A	**JLS350**	350A
JLS50	50A	**JLS400**	400A
JLS60	60A	**JLS450**	450A
JLS70	70A	**JLS500**	500A
JLS80	80A	**JLS600**	600A

FUSE HOLDERS TO SUIT **Refer to page 61**

JLS DIMENSIONS (mm)

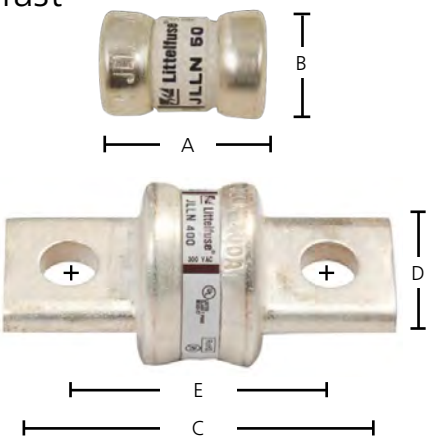
AMPS	A	B	C	D	E
1-30	57	21			
35-60	60	27			
70-100			117	29	92
110-200			146	38	111
225-400			181	51	133
450-600			203	64	152

Industrial Class T

JLLN

Littelfuse

300VAC
fast



JLLN DIMENSIONS (mm)					
AMPS	A	B	C	D	E
1-30	22.4	10.3			
35-60	22.4	14.1			
70-100			54.9	20.6	39.6
110-200			62.0	26.9	42.9
225-400			69.8	33.8	46.7
450-600			77.7	41.1	51.6
700-800			85.8	52.8	64.3
1000-1200			102.0	63.5	64.3

Fast acting for general purpose applications

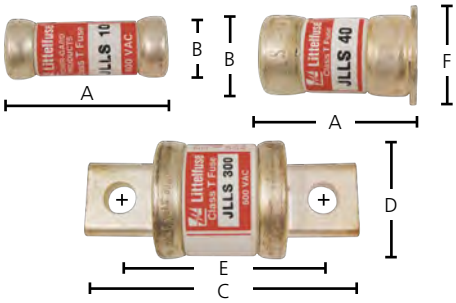
PART NO.	AMP	PART NO.	AMP
JLLN1	1A	**JLLN110**	110A
JLLN2	2A	**JLLN125**	125A
JLLN3	3A	**JLLN150**	150A
JLLN6	6A	**JLLN175**	175A
JLLN10	10A	**JLLN200**	200A
JLLN15	15A	**JLLN225**	225A
JLLN20	20A	**JLLN250**	250A
JLLN25	25A	**JLLN300**	300A
JLLN30	30A	**JLLN350**	350A
JLLN35	35A	**JLLN400**	400A
JLLN40	40A	**JLLN450**	450A
JLLN45	45A	**JLLN500**	500A
JLLN50	50A	**JLLN600**	600A
JLLN60	60A	**JLLN700**	700A
JLLN70	70A	**JLLN800**	800A
JLLN80	80A	**JLLN1000**	1000A
JLLN90	90A	**JLLN1100**	1100A
JLLN100	100A	**JLLN1200**	1200A

FUSE HOLDERS TO SUIT **Refer to page 61**

JLLS

Littelfuse

600VAC
fast



JLLS DIMENSIONS (mm)						
AMPS	A	B	C	D	E	F
1-30	38.1	14.5				
35-60	39.9	20.6				25.4
70-100			75.0	20.8	59.7	
110-200			82.8	27.2	63.7	
225-400			92.1	40.5	69.1	
450-600			101.2	52.4	75.0	
700-800			110.0	63.5	80.5	
900-1200			134.0	66.8	96.5	

Fast acting for general purpose applications

PART NO.	AMP	PART NO.	AMP
JLLS1	1A	**JLLS125**	125A
JLLS2	2A	**JLLS150**	150A
JLLS3	3A	**JLLS175**	175A
JLLS6	6A	**JLLS200**	200A
JLLS10	10A	**JLLS225**	225A
JLLS15	15A	**JLLS250**	250A
JLLS20	20A	**JLLS300**	300A
JLLS25	25A	**JLLS350**	350A
JLLS30	30A	**JLLS400**	400A
JLLS35	35A	**JLLS450**	450A
JLLS40	40A	**JLLS500**	500A
JLLS45	45A	**JLLS600**	600A
JLLS50	50A	**JLLS700**	700A
JLLS60	60A	**JLLS800**	800A
JLLS70	70A	**JLLS900**	900A
JLLS80	80A	**JLLS1000**	1000A
JLLS90	90A	**JLLS1100**	1100A
JLLS100	100A	**JLLS1200**	1200A
JLLS110	110A		

FUSE HOLDERS TO SUIT **Refer to page 61**

Industrial Class L

KLPC

600VAC (480VDC)
time delay

Time delay for Class L applications

PART NO.	AMP	PART NO.	AMP
KLPC200	200	**KLPC1350**	1350
KLPC250	250	**KLPC1400**	1400
KLPC300	300	**KLPC1500**	1500
KLPC350	350	**KLPC1600**	1600
KLPC400	400	**KLPC1800**	1800
KLPC450	450	**KLPC1900**	1900
KLPC500	500	**KLPC2000**	2000
KLPC600	600	**KLPC2100**	2100
KLPC601	601	**KLPC2200**	2200
KLPC650	650	**KLPC2300**	2300
KLPC700	700	**KLPC2500**	2500
KLPC750	750	**KLPC3000**	3000
KLPC800	800	**KLPC3500**	3500
KLPC900	900	**KLPC4000**	4000
KLPC1000	1000	**KLPC4500**	4500
KLPC1100	1100	**KLPC5000**	5000
KLPC1200	1200	**KLPC6000**	6000
KLPC1300	1300		

KLLU

600VAC (300VDC)
time delay

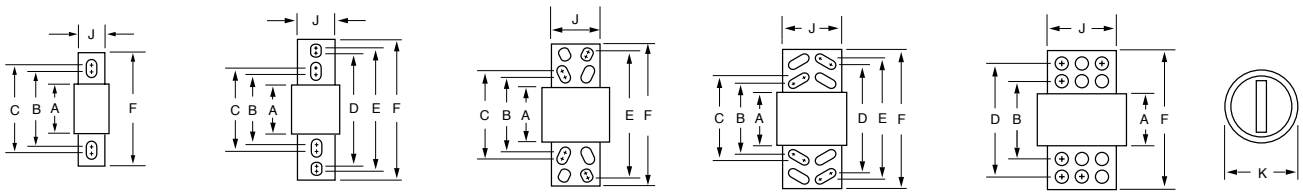
Time delay for Class L applications (higher peak let through current)

PART NO.	AMP	PART NO.	AMP
KLLU601	601	**KLLU1400**	1400
KLLU650	650	**KLLU1500**	1500
KLLU700	700	**KLLU1600**	1600
KLLU750	750	**KLLU1800**	1800
KLLU800	800	**KLLU2000**	2000
KLLU900	900	**KLLU2500**	2500
KLLU1000	1000	**KLLU3000**	3000
KLLU1200	1200	**KLLU3500**	3500
KLLU1350	1350	**KLLU4000**	4000

KLPC & KLLU Dimensions

DIMENSIONS (mm)

AMPS	A	B	C	D	E	F	J	K
200-800	95.3	146.1	171.5			219.1	50.8	63.5
900-1200	95.3	146.1	171.5	235.0	241.3	273.1	50.8	63.5
1300-1600	95.3	146.1	171.5	235.0	241.3	273.1	60.3	76.2
1800-2000	95.3	146.1	171.5	235.0	241.3	273.1	69.9	88.9
2100-2500	101.6	146.1	171.5	235.0	241.3	273.1	88.9	127.0
2501-3000	101.6	146.1	171.5	235.0	241.3	273.1	101.6	127.0
3500-4000	101.6	146.1	171.5	235.0	241.3	273.1	120.7	146.1
4500-5000	101.6	146.1		235.0		273.1	133.4	181.0
6000	101.6	146.1		235.0		273.1	133.4	181.0



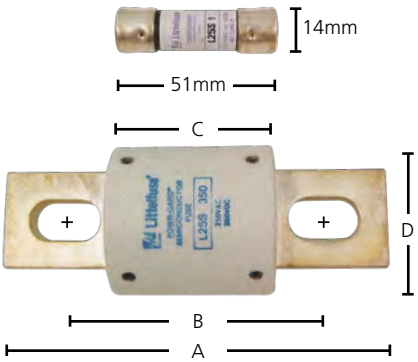
Semiconductor

L25S

Littelfuse

250VAC (250VDC*)

*250VDC 1A-200A, 200VDC 225A-800A



L25S DIMENSIONS (mm)				
AMPS	A	B	C	D
35-60	81.0	60.3	41.4	20.6
70-200	79.5	60.3	41.4	31.0
225-700	97.5	65.8	40.1	38.1
800	97.5	65.8	40.1	50.8

Semiconductor protection

PART NO.	AMP
CARTRIDGE SHAPE	
L25S-1	1A
L25S-2	2A
L25S-3	3A
L25S-4	4A
L25S-5	5A
L25S-6	6A
L25S-8	8A
L25S-10	10A
L25S-12	12A
L25S-15	15A
L25S-20	20A
L25S-25	25A
L25S-30	30A

FUSE HOLDERS TO SUIT **Refer to page 39**

PART NO.	AMP
WITH TAGS	
L25S-35	35A
L25S-40	40A
L25S-45	45A
L25S-50	50A

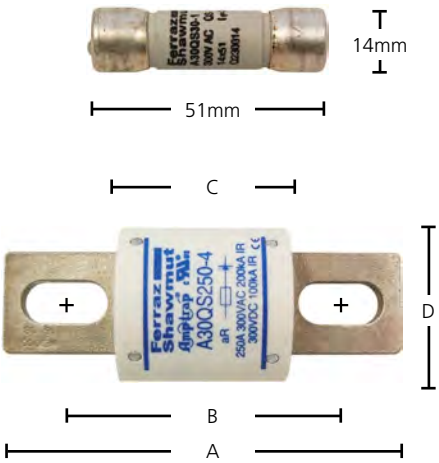
PART NO.	AMP
WITH TAGS	
L25S-60	60A
L25S-70	70A
L25S-80	80A
L25S-90	90A
L25S-100	100A
L25S-125	125A
L25S-150	150A
L25S-175	175A
L25S-200	200A
L25S-225	225A
L25S-250	250A
L25S-275	275A
L25S-300	300A
L25S-350	350A
L25S-400	400A
L25S-450	450A
L25S-500	500A
L25S-600	600A
L25S-700	700A
L25S-800	800A

FUSE HOLDERS TO SUIT **Refer to page 61**

A30QS

Ferraz Shawmut
MERSEN

300VAC/DC



A30QS DIMENSIONS (mm)				
AMPS	A	B	C	D
35-60	81.0	60.3	41.4	21.0
70-200	80.0	60.3	41.4	31.0
225-700	98.0	65.8	40.0	38.0
800	98.0	65.8	40.0	50.8

Semiconductor protection

PART NO.	AMP
CARTRIDGE SHAPE	
A30QS1-1	1A
A30QS2-1	2A
A30QS3-1	3A
A30QS4-1	4A
A30QS5-1	5A
A30QS6-1	6A
A30QS7-1	7A
A30QS8-1	8A
A30QS10-1	10A
A30QS12-1	12A
A30QS15-1	15A
A30QS20-1	20A
A30QS25-1	25A
A30QS30-1	30A

FUSE HOLDERS TO SUIT **Refer to page 39**

PART NO.	AMP
WITH TAGS	
A30QS35-4	35A
A30QS40-4	40A
A30QS50-4	50A
A30QS60-4	60A
A30QS70-4	70A
A30QS80-4	80A

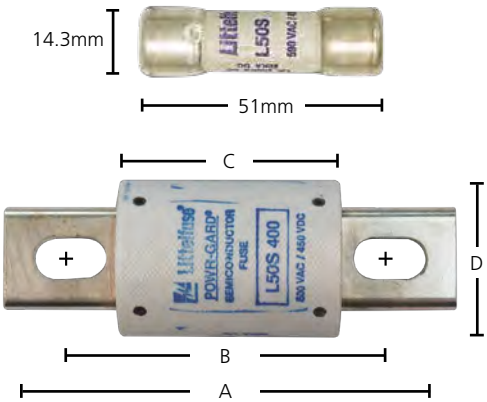
PART NO.	AMP
WITH TAGS	
A30QS90-4	90A
A30QS100-4	100A
A30QS125-4	125A
A30QS130-4	130A
A30QS150-4	150A
A30QS175-4	175A
A30QS200-4	200A
A30QS225-4	225A
A30QS250-4	250A
A30QS300-4	300A
A30QS350-4	350A
A30QS400-4	400A
A30QS450-4	450A
A30QS500-4	500A
A30QS550-4	550A
A30QS600-4	600A
A30QS700-4	700A
A30QS800-4	800A

FUSE HOLDERS TO SUIT **Refer to page 61**

Semiconductor

L50S

500VAC (450VDC)



L50S DIMENSIONS (mm)				
AMPS	A	B	C	D
35-60	81.0	60.3	41.4	20.6
70-100	92.2	72.6	54.1	25.4
125-200	92.2	73.0	54.1	31.0
225-400	110.0	78.5	53.1	38.1
450-600	114.0	81.7	56.4	50.8
700-800	164.0	113.1	56.4	63.5

Semiconductor protection

PART NO.	AMP
CARTRIDGE SHAPE	
L50S-10	10A
L50S-12	12A
L50S-15	15A
L50S-20	20A
L50S-25	25A
L50S-30	30A

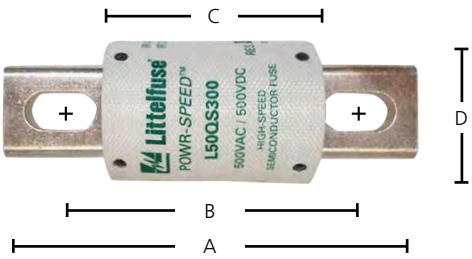
FUSE HOLDERS TO SUIT **Refer to page 39**

PART NO.	AMP
WITH TAGS	
L50S-35	35A
L50S-40	40A
L50S-50	50A
L50S-60	60A
L50S-70	70A
L50S-80	80A
L50S-90	90A
L50S-100	100A
L50S-125	125A
L50S-150	150A
L50S-175	175A
L50S-200	200A
L50S-225	225A
L50S-250	250A
L50S-275	275A
L50S-300	300A
L50S-350	350A
L50S-400	400A
L50S-450	450A
L50S-500	500A
L50S-550	550A
L50S-600	600A
L50S-700	700A
L50S-800	800A

FUSE HOLDERS TO SUIT **Refer to page 61**

L50QS

500VAC/DC



L50QS DIMENSIONS (mm)				
AMPS	A	B	C	D
35-100	92.1	70.6	54.0	25.4
125-200	92.1	72.1	54.0	30.9
225-400	110.3	78.6	53.2	38.1
450-600	113.5	81.8	56.3	50.8
700-800	157.2	107.1	56.3	63.5
900-1200	177.0	126.2	81.8	76.2

Semiconductor protection

PART NO.	AMP
WITH TAGS	
L50QS35	35A
L50QS40	40A
L50QS50	50A
L50QS60	60A
L50QS70	70A
L50QS80	80A
L50QS90	90A
L50QS100	100A
L50QS125	125A
L50QS150	150A
L50QS175	175A
L50QS200	200A
L50QS225	225A
L50QS250	250A

PART NO.	AMP
WITH TAGS	
L50QS275	275A
L50QS300	300A
L50QS325	325A
L50QS350	350A
L50QS400	400A
L50QS450	450A
L50QS500	500A
L50QS600	600A
L50QS700	700A
L50QS800	800A
A50QS900-4	900A
A50QS1000-4	1000A
A50QS1200-4	1200A

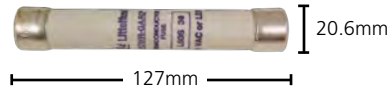
FUSE HOLDERS TO SUIT **Refer to page 61**

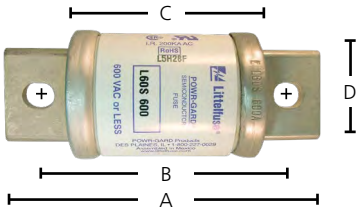
Semiconductor

L60S

Littelfuse

600VAC





L60S DIMENSIONS (mm)				
AMPS	A	B	C	D
35-60	111.1	90.5	70.6	20.6
70-100	113.5	92.8	73.9	25.4
125-200	111.9	92.9	73.9	31.0
225-400	130.2	103.2	73.2	38.1
450-600	130.2	103.0	73.2	50.8
700-800	184.2	134.5	76.2	63.5

Semiconductor protection

PART NO.	AMP
CARTRIDGE SHAPE	
L60S-1	1A
L60S-2	2A
L60S-3	3A
L60S-4	4A
L60S-5	5A
L60S-6	6A
L60S-8	8A
L60S-10	10A
L60S-12	12A
L60S-15	15A
L60S17.5	17.5A
L60S-20	20A
L60S-25	25A
L60S-30	30A

FUSE HOLDERS TO SUIT
9108001 (Disconnect switch)

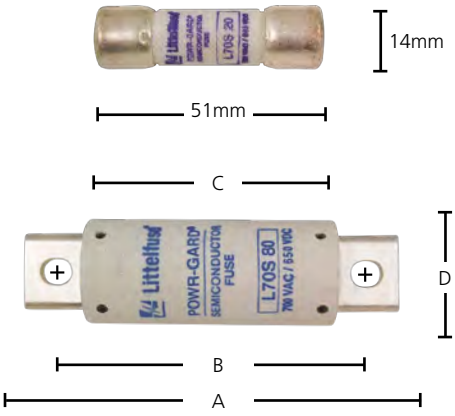
PART NO.	AMP
WITH TAGS	
L60S-35	35A
L60S-40	40A
L60S-45	45A
L60S-50	50A
L60S-60	60A
L60S-70	70A
L60S-80	80A
L60S-90	90A
L60S-100	100A
L60S-125	125A
L60S-150	150A
L60S-175	175A
L60S-200	200A
L60S-225	225A
L60S-250	250A
L60S-300	300A
L60S-350	350A
L60S-400	400A
L60S-450	450A
L60S-500	500A
L60S-600	600A
L60S-700	700A
L60S-800	800A

FUSE HOLDERS TO SUIT **Refer to page 61**

L70S

Littelfuse

700VAC (650VDC)



L70S DIMENSIONS (mm)				
AMPS	A	B	C	D
35-60	111.0	91.6	73.2	25.4
70-100	111.0	92.1	73.2	31.0
125-200	129.0	97.6	72.1	38.1
225-400	129.0	97.6	72.1	50.8
450-600	180.0	129.0	72.1	63.5
700-800	173.0	135.0	84.1	73.2

Semiconductor protection

PART NO.	AMP
CARTRIDGE SHAPE	
L70S-10	10A
L70S-15	15A
L70S-20	20A
L70S-25	25A
L70S-30	30A

FUSE HOLDERS TO SUIT **Refer to page 39**

PART NO.	AMP
WITH TAGS	
L70S-35	35A
L70S-40	40A
L70S-50	50A
L70S-60	60A
L70S-70	70A
L70S-80	80A
L70S-90	90A
L70S-100	100A
L70S-125	125A
L70S-150	150A
L70S-175	175A
L70S-200	200A
L70S-225	225A
L70S-250	250A
L70S-300	300A
L70S-350	350A
L70S-400	400A
L70S-450	450A
L70S-500	500A
L70S-600	600A
L70S-700	700A
L70S-800	800A

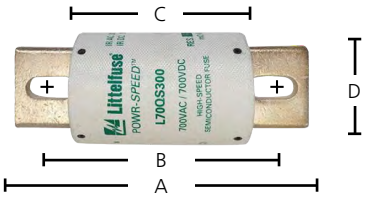
FUSE HOLDERS TO SUIT **Refer to page 61**

Semiconductor

L70QS

Littelfuse

700VAC/DC



L70QS DIMENSIONS (mm)				
AMPS	A	B	C	D
35-100	111.1	88.2	73.0	25.4
125-200	129.2	97.5	73.0	30.9
225-400	129.4	97.7	72.2	50.8
450-600	180.1	123.1	72.2	50.8
700-800	173.1	123.0	72.2	63.5

Semiconductor protection

PART NO.	AMP
WITH TAGS	
L70QS35	35A
L70QS40	40A
L70QS50	50A
L70QS60	60A
L70QS70	70A
L70QS80	80A
L70QS90	90A
L70QS100	100A
L70QS125	125A
L70QS150	150A
L70QS175	175A

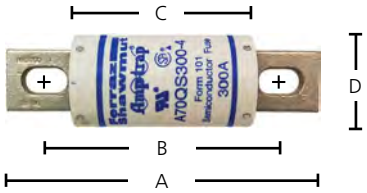
PART NO.	AMP
WITH TAGS	
L70QS200	200A
L70QS225	225A
L70QS250	250A
L70QS300	300A
L70QS350	350A
L70QS400	400A
L70QS450	450A
L70QS500	500A
L70QS600	600A
L70QS700	700A
L70QS800	800A

FUSE HOLDERS TO SUIT **Refer to page 61**

A70Q

MERSEN

700VAC (650VDC)



A70Q DIMENSIONS (mm)				
AMPS	A	B	C	D
35-60	111.0	83.8	49.8	31.0
70-100	111.0	83.8	49.8	31.0
125-200	129.0	89.9	49.8	38.1
250-400	129.0	88.3	49.8	50.8
450-600	180.0	113.8	49.8	63.5

Semiconductor protection

PART NO.	AMP
WITH TAGS	
A70Q35-4	35A
A70Q40-4	40A
A70Q50-4	50A
A70Q60-4	60A
A70Q70-4	70A
A70Q80-4	80A
A70Q90-4	90A
A70Q100-4	100A
A70Q125-4	125A
A70Q150-4	150A

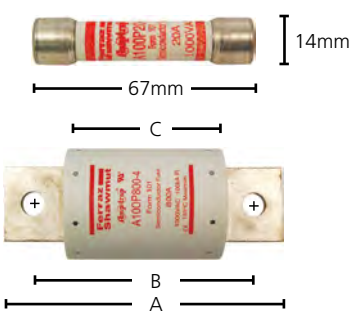
PART NO.	AMP
WITH TAGS	
A70Q175-4	175A
A70Q200-4	200A
A70Q250-4	250A
A70Q300-4	300A
A70Q350-4	350A
A70Q400-4	400A
A70Q450-4	450A
A70Q500-4	500A
A70Q600-4	600A

FUSE HOLDERS TO SUIT **Refer to page 61**

A100P

MERSEN

1000VAC (750VDC)



A100P DIMENSIONS (mm)				
AMPS	A	B	C	D
35-60	127.0	107.5	173.0	25.4
80-100	127.0	107.5	173.0	31.0
125-200	145.0	113.5	88.1	38.1
225-400	145.0	113.5	88.1	50.8
500-1000	196.0	145.0	88.1	63.5

Semiconductor protection

PART NO.	AMP
CARTRIDGE SHAPE	
A100P15-1	15A
A100P20-1	20A
A100P25-1	25A
A100P30-1	30A

FUSE HOLDERS TO SUIT **Contact Fuseco**

PART NO.	AMP
WITH TAGS	
A100P35-4	35A
A100P40-4	40A
A100P50-4	50A
A100P60-4	60A
A100P80-4	80A
A100P100-4	100A

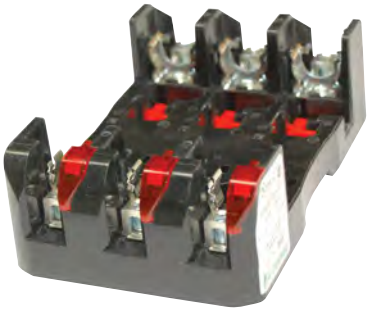
PART NO.	AMP
WITH TAGS	
A100P125-4	125A
A100P150-4	150A
A100P200-4	200A
A100P225-4	225A
A100P250-4	250A
A100P300-4	300A
A100P350-4	350A
A100P400-4	400A
A100P500-4	500A
A100P600-4	600A
A100P650-4	650A
A100P700-4	700A
A100P800-4	800A
A100P1000-4	1000A

FUSE HOLDERS TO SUIT **Refer to page 61**

Industrial Fuse Holders

Fuse Blocks

open fuse base



SERIES	CLASS / TYPE	FOR USE WITH	AMP
LFH25	Class H, K5 & R 250V	NLN	1-600
LFH60	Class H, K5 & R 600V	NLS	1-600
LFR25	Class H, K5 & R 250V	FLNR (ID), KLNR	1/10-600
LFR60	Class H, K5 & R 600V	FLSR (ID), KLSR	1/10-600
LFJ60	Class J 600V	JTD	8/10-600
LFJ60	Class J 600V	JLS	1-600
LFT30	Class T 300V	JLLN	1-1200
LFT60	Class T 600V	JLLS	1-1200
LFG60	Class G 600V	SLC	1/2-20
LFG48	Class G 480V	SLC	25-60

NOTE: These holders are available in single pole & three pole, they are also available with shrouds and covers. **Please contact Fuseco for fuse holder selection**

Semiconductor Fuse holders

LSCR

700VAC
modular fuse bases

Fuse holders to suit bolt in fuses

PART NO.	AMP	STUD Ø
LSCR001	400A	6.35mm

Suitable for	AMP
L25S, A30QS	35-200
L50S	35-100
L50QS	35-200
L60S	35-200
L70S, L70QS	35-200
A100P	35-60

PART NO.	AMP	STUD Ø
LSCR002	800A	9.5mm

Suitable for	AMP
L25S, A30QS	225-800
L50S	225-800
L50QS	225-800
L60S	225-800
L70S, L70QS	125-800
A100P	125-800

Fuse Blocks

1000VAC
fuse base

One piece fuse holder to suit bolt in fuses

PART NO.	FOR USE WITH	AMP
P243	L25S, A30QS L50S	35-200 35-60
P243C	L60S, A70QS L70S A70Q	35-200 35-100 125-400
P243E	L50S A50QS	70-200 35-200
P243G	L25S, A30QS	225-800

PART NO.	FOR USE WITH	AMP
P266A	L60S L70S A70QS	225-600 125-400 225-600
P266C	L50S, A50QS A70Q	225-600 35-100
P266F	L70S L60S, A70QS	450-800 700-800
P266G	A100P	35-100
P266L	A100P A70Q	125-400 450-600

FUSECO

FuseMaster NH Fuses

NH00F
NH000F

FuseMaster

500VAC (250VDC)
fast (gG)

DIMENSIONS (mm) REFER TO DIAGRAM BELOW					
AMP	Size	A	B	C	D
4-100	00C	49	78	40	21
125-160	00	49	78	48	30

Class gG for cable and line protection

PART NO.	SIZE	AMP
NH000F-2	00C	2
NH000F-4	00C	4
NH000F-6	00C	6
NH000F-10	00C	10
NH000F-16	00C	16
NH000F-20	00C	20
NH000F-25	00C	25
NH000F-32	00C	32
NH000F-35	00C	35
NH000F-40	00C	40
NH000F-50	00C	50
NH000F-63	00C	63
NH000F-80	00C	80
NH000F-100	00C	100
NH00F-125	00	125
NH00F-160	00	160

FUSE HOLDERS TO SUIT **Refer to pages 68, 69**

NH1F

FuseMaster

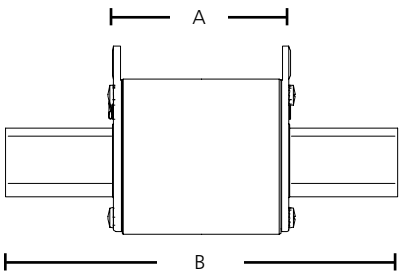
500VAC (440VDC)
fast (gG)

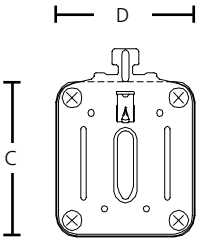
DIMENSIONS (mm) REFER TO DIAGRAM BELOW					
AMP	Size	A	B	C	D
16-160	1C	65	135	46	28
200-250	1	65	135	46	46

Class gG for cable and line protection

PART NO.	SIZE	AMP
NH1F-16	1C	16
NH1F-20	1C	20
NH1F-25	1C	25
NH1F-32	1C	32
NH1F-35	1C	35
NH1F-40	1C	40
NH1F-50	1C	50
NH1F-63	1C	63
NH1F-80	1C	80
NH1F-100	1C	100
NH1F-125	1C	125
NH1F-160	1C	160
NH1F-200	1	200
NH1F-224	1	224
NH1F-250	1	250

FUSE HOLDERS TO SUIT **Refer to pages 68, 69**



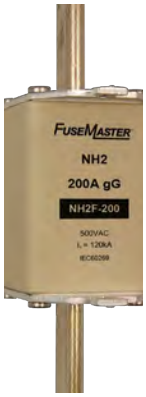


FuseMaster NH Fuses

NH2F

FuseMaster

500VAC (440VDC)
fast (gG)



DIMENSIONS (mm) REFER TO DIAGRAM BELOW					
AMP	Size	A	B	C	D
35-160	2CC	65	150	46	28
200-250	2C	65	150	47.5	47.5
300-400	2	65	150	56	56.5

Class gG for cable and line protection

PART NO.	SIZE	AMP
NH2F-35	2CC	35
NH2F-40	2CC	40
NH2F-50	2CC	50
NH2F-63	2CC	63
NH2F-80	2CC	80
NH2F-100	2CC	100
NH2F-125	2CC	125
NH2F-160	2CC	160
NH2F-200	2C	200
NH2F-224	2C	224
NH2F-250	2C	250
NH2F-315	2	315
NH2F-355	2	355
NH2F-400	2	400

FUSE HOLDERS TO SUIT **Refer to pages 68, 69**

NH3F

FuseMaster

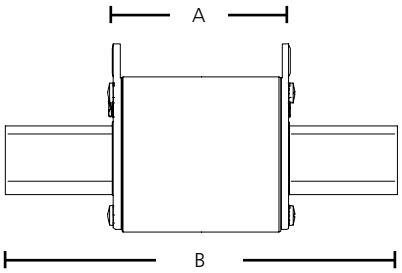
500VAC (440VDC)
fast (gG)

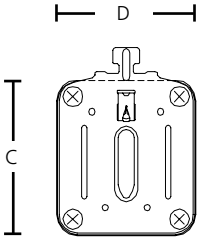
DIMENSIONS (mm) REFER TO DIAGRAM BELOW					
AMP	Size	A	B	C	D
315-400	3C	68	150	56.5	57
425-630	3	68	150	66.5	67

Class gG for cable and line protection

PART NO.	SIZE	AMP
NH3F-315	3C	315
NH3F-355	3C	355
NH3F-400	3C	400
NH3F-425	3	425
NH3F-500	3	500
NH3F-630	3	630

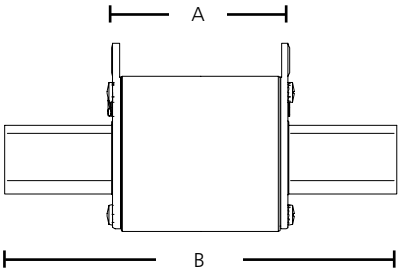
FUSE HOLDERS TO SUIT **Refer to pages 68, 69**

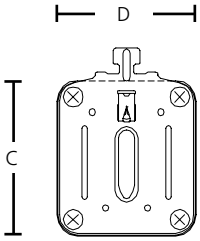




Size 00/000

FUSE HOLDERS TO SUIT **Refer to pages 68, 69**





2000013 / 2000113

SIBA

500VAC (220VDC)
fast (gG)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2000013	2-100	000	47	78	40.5	20.5
2000113	125-160	00	47	78	46	29.5

Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
2000013-2	2A	**2000013-35**	35A
2000013-4	4A	**2000013-40**	40A
2000013-6	6A	**2000013-50**	50A
2000013-10	10A	**2000013-63**	63A
2000013-16	16A	**2000013-80**	80A
2000013-20	20A	**2000013-100**	100A
2000013-25	25A	**2000113-125**	125A
2000013-32	32A	**2000113-160**	160A

2047713 / 2020913

SIBA

690VAC (220VDC)
fast (gG)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2047713	6-63	000	47	78	40.5	20.5
2020913	80-125	00	47	78	46	29.5

Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
2047713-6	6A	**2047713-40**	40A
2047713-10	10A	**2047713-50**	50A
2047713-16	16A	**2047713-63**	63A
2047713-20	20A	**2020913-80**	80A
2047713-25	25A	**2020913-100**	100A
2047713-32	32A	**2020913-125**	125A
2047713-35	35A		

2047708 / 2020908

SIBA

690VAC
slow (aM)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2047708	2-50	000	47	78	40.5	20.5
2020908	63-160	00	47	78	46	29.5

Class aM for motor applications and other circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
2047708-2	2A	**2047708-35**	35A
2047708-4	4A	**2047708-40**	40A
2047708-6	6A	**2047708-50**	50A
2047708-10	10A	**2020908-63**	63A
2047708-16	16A	**2020908-80**	80A
2047708-20	20A	**2020908-100**	100A
2047708-25	25A	**2020908-125**	125A
2047708-32	32A	**2020908-160**	160A

Ultra Rapid Fuses

SIBA

690VAC
gR/aR

Bussmann

PERFORMANCE	AMP
gR	10A – 100A
aR	125A – 315A

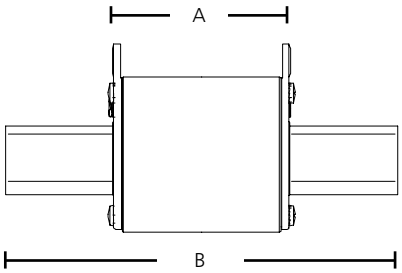
DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2047720	6-50	000	47	78	40.5	20.5
2020920	63-160	00	47	78	46	29.5
170M...	200-315	00/000	49	79	40.5	20.5
10-100A class gR / 125-315A class aR						

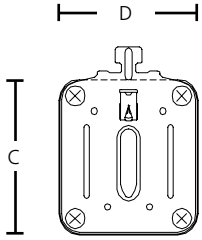
Class gR and aR for the protection of semiconductors

PART NO.	AMP	TOTAL I^2t @ 690V (A^2s)	PART NO.	AMP	TOTAL I^2t @ 690V (A^2s)
2047720-6	6A	-	**2020920-63**	63A	1400
2047720-10	10A	18	**2020920-80**	80A	2600
2047720-16	16A	40	**2020920-100**	100A	4500
2047720-20	20A	91	**2020920-125**	125A	9100
2047720-25	25A	90	**2020920-160**	160A	15000
2047720-32	32A	330	**170M1570**	200A	28000
2047720-35	35A	380	**170M1571**	250A	51500
2047720-40	40A	450	**170M1572**	315A	80500
2047720-50	50A	820			

Size 1

FUSE HOLDERS TO SUIT **Refer to pages 68, 69**





2000313

SIBA

500VAC (440VDC)
fast (gG)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2000313	16-160	1	65	135	46	29.5
2000313	200-315	1	65	135	51.5	42

Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
2000313-16	16A	**2000313-100**	100A
2000313-20	20A	**2000313-125**	125A
2000313-25	25A	**2000313-160**	160A
2000313-35	35A	**2000313-200**	200A
2000313-40	40A	**2000313-224**	224A
2000313-50	50A	**2000313-250**	250A
2000313-63	63A	**2000313-315**	315A
2000313-80	80A		

2021113

SIBA

690VAC (440VDC) fast
(gG)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2021113	16-250	1	65	135	51.5	42

Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
2021113-16	16A	**2021113-63**	63A
2021113-20	20A	**2021113-80**	80A
2021113-25	25A	**2021113-100**	100A
2021113-32	32A	**2021113-125**	125A
2021113-35	35A	**2021113-160**	160A
2021113-40	40A	**2021113-200**	200A
2021113-50	50A	**2021113-250**	250A

2021108

SIBA

690VAC
slow (aM)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2021108	16-250	1	65	135	51.5	42

Class aM for motor applications and other circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
2021108-16	16A	**2021108-80**	80A
2021108-20	20A	**2021108-100**	100A
2021108-25	25A	**2021108-125**	125A
2021108-35	35A	**2021108-160**	160A
2021108-40	40A	**2021108-200**	200A
2021108-50	50A	**2021108-224**	224A
2021108-63	63A	**2021108-250**	250A

Ultra Rapid Fuses

SIBA

690VAC
gR/aR

Bussmann

PERFORMANCE	AMP
gR	16A - 100A
aR	125A - 400A

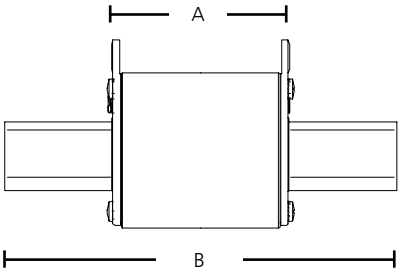
DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2021120	16-315	1	65	135	51.5	42
170M....	350-400	1	69	135	43	45
16-100A class gR / 125-400A class aR						

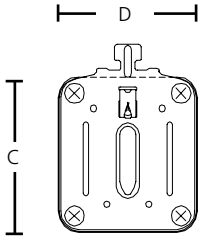
Class gR and aR for the protection of semiconductors

PART NO.	AMP	TOTAL I^2t @ 690V (A^2s)	PART NO.	AMP	TOTAL I^2t @ 690V (A^2s)
2021120-16	16A	Contact Fuseco	**2021120-100**	100A	4700
2021120-20	20A		**2021120-125**	125A	7600
2021120-25	25A		**2021120-160**	160A	14000
2021120-32	32A		**2021120-200**	200A	21000
2021120-40	40A	570	**2021120-250**	250A	36000
2021120-50	50A	1000	**2021120-315**	315A	76000
2021120-63	63A	1800	**170M3818**	355A	68500
2021120-80	80A	3400	**170M3819**	400A	105000

Size 2

FUSE HOLDERS TO SUIT **Refer to pages 68, 69**





2000413

SIBA

500VAC (440VDC)
fast (gG)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2000413	35-160	2	65	150	46	29.5
2000413	200-250	2	65	150	51.5	42
2000413	300-400	2	65	150	59	53

Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
2000413-35	35A	**2000413-200**	200A
2000413-40	40A	**2000413-224**	224A
2000413-50	50A	**2000413-250**	250A
2000413-63	63A	**2000413-300**	300A
2000413-80	80A	**2000413-315**	315A
2000413-100	100A	**2000413-355**	355A
2000413-125	125A	**2000413-400**	400A
2000413-160	160A		

2021213

SIBA

690VAC (440VDC)
fast (gG)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2021213	35-200	2	65	150	51.5	42
2021213	224-400	2	65	150	59	53

Class gG for cable and line protection

PART NO.	AMP	PART NO.	AMP
2021213-35	35A	**2021213-200**	200A
2021213-40	40A	**2021213-224**	224A
2021213-50	50A	**2021213-250**	250A
2021213-63	63A	**2021213-300**	300A
2021213-80	80A	**2021213-315**	315A
2021213-100	100A	**2021213-355**	355A
2021213-125	125A	**2021213-400**	400A
2021213-160	160A		

2021208

SIBA

690VAC
slow (aM)

DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2021208	35-200	2	65	150	51.5	42
2021208	250-400	2	65	150	59	53

Class aM for motor applications and other circuits with high inrush currents

PART NO.	AMP	PART NO.	AMP
2021208-35	35A	**2021208-160**	160A
2021208-50	50A	**2021208-200**	200A
2021208-63	63A	**2021208-250**	250A
2021208-80	80A	**2021208-315**	315A
2021208-100	100A	**2021208-355**	355A
2021208-125	125A	**2021208-400**	400A

Ultra Rapid Fuses

SIBA

Bussmann

690VAC (aR)

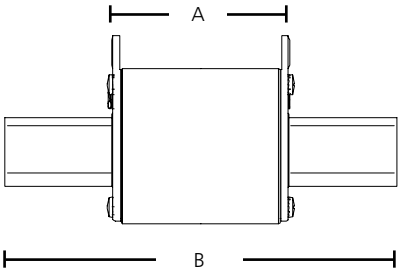
DIMENSIONS (mm) REFER TO DIAGRAM ABOVE						
PART NO.	AMPS	SIZE	A	B	C	D
2021220	80-250	2	65	150	51.5	42
2021220	315-450	2	65	150	59	53
170M...	500-700	2	69	150	59	55
16-100A class gR / 125-400A class aR						

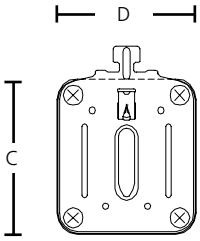
Class aR for the protection of semiconductors

PART NO.	AMP	TOTAL I^2t @ 690V (A^2s)	PART NO.	AMP	TOTAL I^2t @ 690V (A^2s)
2021220-80	80A	Contact Fuseco	**2021220-350**	350A	100000
2021220-100	100A		**2021220-400**	400A	145000
2021220-125	125A		**2021220-450**	450A	220000
2021220-160	160A	14000	**170M5810**	500A	145000
2021220-200	200A	21000	**170M5811**	550A	190000
2021220-250	250A	63000	**170M5812**	630A	275000
2021220-315	315A	76000	**170M5813**	700A	405000

Size 3

FUSE HOLDERS TO SUIT **Refer to pages 68, 69**





2000513

500VAC (400VDC)
fast (gG)

DIMENSIONS (mm)	REFER TO DIAGRAM ABOVE					
PART NO.	AMPS	SIZE	A	B	C	D
2000513	315-400	3	65	150	59	53
2000513	425-630	3	65	150	73.5	65

Class gG for cable and line protection

PART NO.	AMP
2000513-315	315A
2000513-355	355A
2000513-400	400A
2000513-425	425A

PART NO.	AMP
2000513-450	450A
2000513-500	500A
2000513-630	630A
V228523	800A

2021313

690VAC (440VDC)
fast (gG)

DIMENSIONS (mm)	REFER TO DIAGRAM ABOVE					
PART NO.	AMPS	SIZE	A	B	C	D
2021313	300-315	3	65	150	59	53
2021313	355-425	3	65	150	73.5	65
2021313	500-630	3	65	150	73	73

Class gG for cable and line protection

PART NO.	AMP
2021313-300	300A
2021313-315	315A
2021313-355	355A
2021313-400	400A

PART NO.	AMP
2021313-425	425A
2021313-500	500A
2021313-630	630A

2021308

690VAC
slow (aM)

DIMENSIONS (mm)	REFER TO DIAGRAM ABOVE					
PART NO.	AMPS	SIZE	A	B	C	D
2021308	315	3	65	150	59	53
2021308	400	3	65	150	73.5	65
2021308	500-630	3	65	150	73	73

Class aM for motor applications and other circuits with high inrush currents

PART NO.	AMP
2021308-315	315A
2021308-400	400A
2021308-500	500A
2021308-630	630A

Ultra Rapid Fuses

690VAC (aR)

DIMENSIONS (mm)	REFER TO DIAGRAM ABOVE					
PART NO.	AMPS	SIZE	A	B	C	D
2021320	315-400	3	65	150	59	53
2021320	450-710	3	65	150	73.5	65
2021320	800	3	68	150	74	76
170M...	900-1000	3	68	150	74	76

Class aR for the protection of semiconductors

PART NO.	AMP	TOTAL I^2t @ 690V (A^2s)
2021320-250	250A	-
2021320-315	315A	76000
2021320-350	350A	100000
2021320-400	400A	150000
2021320-450	450A	220000
2021320-500	500A	300000

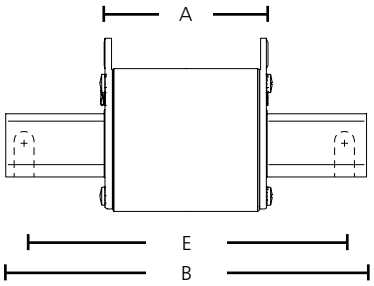
PART NO.	AMP	TOTAL I^2t @ 690V (A^2s)
2021320-550	550A	400000
2021320-630	630A	490000
2021320-710	710A	610000
2021320-800	800A	1050000
170M6813	900A	670000
170M6814	1000A	945000

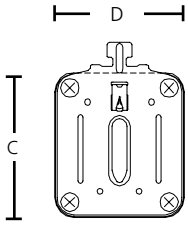
Size 4 & 4A

Size 4A

Size 4

PART NO.	VOLTAGE	AMP	PERFORMANCE	A	B	C	D	E
Size 4A (Blade)								
2012013	500V	400-1600	gG	87	200	110	102	-
2022713	690V	400-800	gG	87	200	110	102	-
2022708	690V	400-1000	aM	87	200	110	102	-
Size 4 (Slotted Blade)								
2000613	500V	400-1250	gG	65	200	110	102	150
2022813	500V	1600	gG	87	200	110	102	150
2022513	690V	400-800	gG	65	200	110	102	150
2022508	690V	400-1000	aM	65	200	110	102	150





NH Open Fuse Base

Single pole

Single pole with shrouds & cover

Triple pole

Triple pole with shrouds & cover

PART NO.	NH SIZE	AMP	VOLTAGE
Single Pole			
352100-1	00/000	160A	690V
352250-1	1	250A	690V
352400-1	2	400A	690V
352630-1	3	630A	690V
Single Pole with Shrouds & Cover			
352100-1SC	00/000	160A	690V
352250-1SC	1	250A	690V
352400-1SC	2	400A	690V
352630-1SC	3	630A	690V
Triple Pole			
352100-3	00/000	160A	690V
352250-3	1	250A	690V
352400-3	2	400A	690V
352630-3	3	630A	690V
Triple Pole with Shrouds & Cover			
352100-3SC	00/000	160A	690V
352250-3SC	1	250A	690V
352400-3SC	2	400A	690V
352630-3SC	3	630A	690V

NH Fuse Disconnect Switches

690VAC

FuseMaster

cdf Electric

NH00-3DS

335040

PART NO.	TO SUIT FUSE SIZE	POLE	DESCRIPTION	PACK QTY
335005	000	3	Triple Pole 100A Disconnect Switch	1
335040	00/000	3	Triple Pole 160A Disconnect Switch with Busbar	1
NH00-3DS	00/000	3	Triple Pole 160A Disconnect Switch	1
NH1-3DS	1	3	Triple Pole 250A Disconnect Switch	1
NH2-3DS	2	3	Triple Pole 400A Disconnect Switch	1
NH3-3DS	3	3	Triple Pole 630A Disconnect Switch	1

Note For Semiconductor (Ultra Rapid) Fuses

Watts loss values of fuse and fuse holder combined must be considered if intending to use semiconductor fuses in these enclosed holders.
Contact Fuseco for further advice.

NH Fuse Accessories

Grip Handles

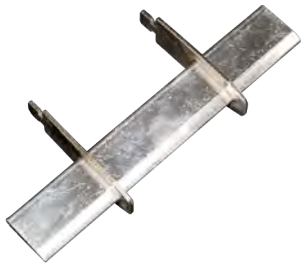
SIBA

PART NO.	DESCRIPTION	SIZE	VOLTAGE	PACK SIZE
2200102	Grip Handle	00-3	690V	1
2200105	Protected Grip Tool	00-3	690V	1
2203101	Grip Handle	3	1500V	1
2212001	Grip Handle	4-4a	690V	1

NH Neutral Links

SIBA

FuseMaster



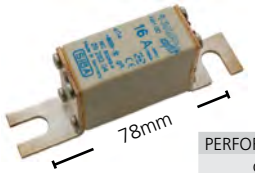
SIBA PART NO.	FUSEMASTER PART NO.	SIZE	AMP RATING	VOLTAGE	PACK SIZE
2400102	**NH00-NL**	00	160A	690V	10
2400202	**–**	0	160A	690V	10
2400302	**NH1NL**	1	250A	690V	10
2400402	**NH2-NL**	2	400A	690V	10
2400502	**NH3-NL**	3	630A	690V	10
2400602	**–**	4	1250A	690V	10
2400607	**–**	4a	1250A	690V	10

DIN80-000 Offset Tag

2028204

SIBA

660VAC
ultra rapid (gR/ar)



PERFORMANCE	AMP
gR	16A - 100A
aR	125A - 160A

Class aR for semiconductor protection. Size 000, compact body

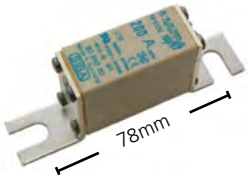
PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2028204-16	16A	5W	70
2028204-20	20A	6W	120
2028204-25	25A	7W	200
2028204-32	32A	9W	450
2028204-35	35A	9W	550
2028204-40	40A	10W	700

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2028204-50	50A	11W	1300
2028204-63	63A	13W	2300
2028204-80	80A	18W	3500
2028204-100	100A	22W	6400
2028204-125	125A	24W	11200
2028204-160	160A	28W	29000

2028220

SIBA

690VAC/700VAC
ultra rapid (aR)



Class aR for semiconductor protection. Size 000, compact body

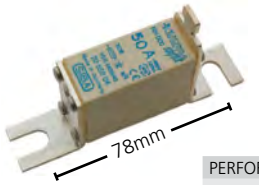
PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2028220-32	32A	8W	290
2028220-35	35A	9W	360
2028220-40	40A	10W	500
2028220-50	50A	12W	770
2028220-63	63A	14W	1400
2028220-80	80A	18W	2600
2028220-100	100A	22W	4000

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2028220-125	125A	26W	7200
2028220-160	160A	32W	15400
2028220-180	180A	35W	20400
2028220-200	200A	39W	25000
2028220-250	250A	47W	44000
2028220-315	315A	58W	77000

2055804

SIBA

660VAC
ultra rapid (gR/ar)
with microswitch
facility



PERFORMANCE	AMP
gR	16A - 100A
aR	125A - 160A

Class aR for semiconductor protection. Size 000, compact body

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2055804-16	16A	5W	70
2055804-20	20A	6W	120
2055804-25	25A	7W	200
2055804-32	32A	9W	450
2055804-35	35A	9W	550
2055804-40	40A	10W	700

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2055804-50	50A	11W	1300
2055804-63	63A	13W	2300
2055804-80	80A	18W	3500
2055804-100	100A	22W	6400
2055804-125	125A	24W	11200
2055804-160	160A	28W	29000

Fuse Holders for DIN80-00/000

2118901

SIBA

Open fuse base

2118908

Fuse base with covers

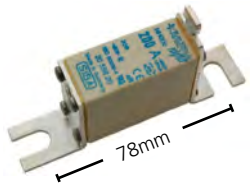
Note:
Can only be used with DIN80 - 00/000 fuses WITHOUT micro switch facility.

DIN80-000 Offset Tag

2055820

SIBA

690VAC/700VAC
ultra rapid (aR), with
microswitch
facility



Class aR for semiconductor protection. Size 000, compact body

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2055820-32	32A	8W	290
2055820-35	35A	9W	360
2055820-40	40A	10W	500
2055820-50	50A	12W	770
2055820-63	63A	14W	1400
2055820-80	80A	18W	2600
2055820-100	100A	22W	4000

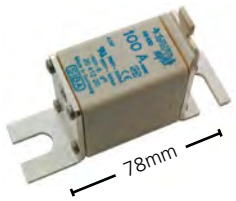
PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2055820-125	125A	26W	7200
2055820-160	160A	32W	15400
2055820-180	180A	35W	20400
2055820-200	200A	39W	25000
2055820-250	250A	47W	44000
2055820-315	315A	58W	77000

DIN80-00 Offset Tag

2041220

SIBA

690VAC/700VAC
ultra rapid (aR), with
microswitch
facility



Class aR for semiconductor protection. Size 00 body

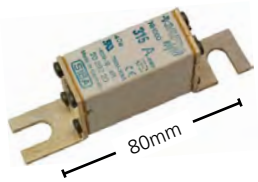
PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2041220-35	35A	8W	360
2041220-40	40A	10W	500
2041220-50	50A	12W	770
2041220-63	63A	14W	1400
2041220-80	80A	17W	2600
2041220-100	100A	21W	4000
2041220-125	125A	25W	7200

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2041220-160	160A	31W	15400
2041220-180	180A	34W	23100
2041220-200	200A	37W	27500
2041220-250	250A	44W	46800
2041220-315	315A	53W	86000
2041220-350	350A	57W	110000
2041220-400	400A	68W	156000

2029220

SIBA

700VDC
ultra rapid (aR),



Class aR for semiconductor protection. Size 00. Designed for DC circuits.

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2029220-35	35A	14W	135
2029220-50	50A	17W	530
2029220-63	63A	20W	690
2029220-80	80A	23W	1650
2029220-100	100A	26W	4300

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 660V (A^2s)
2029220-125	125A	30W	6400
2029220-160	160A	35W	8000
2029220-200	200A	40W	16000
2029220-250	250A	45W	22900
2029220-315	315A	51W	46000

Microswitches for DIN80-00/000

2800201

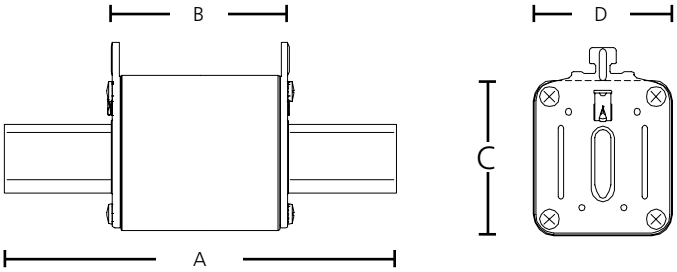
SIBA

Black Hammer
Microswitch.
To suit DIN80-00
size fuse.

2800202

Red Hammer
Microswitch.
To suit DIN80-000
size fuse.

NH Blade Ultra Rapid



Size 00/000

690VAC
ultra rapid
(gR, aR)

SIBA
Bussmann

DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2047720	6-50	000	78	47	40.5	20.5
2020920	63-160	00	78	47	46	29.5
170M...	200-315	000	78	47	40.5	20.5

Class gR and aR for semiconductor protection

PART NO.	AMP	BODY SIZE	CLASS	POWER LOSS	TOTAL I^2t @ 690V (A^2s)
2047720-6	6A	000	gR	-	-
2047720-10	10A	000	gR	2.5W	18
2047720-16	16A	000	gR	4.1W	40
2047720-20	20A	000	gR	5.5W	91
2047720-25	25A	000	gR	6W	110
2047720-32	32A	000	gR	7.1W	250
2047720-35	35A	000	gR	-	-
2047720-40	40A	000	gR	9.2W	450
2047720-50	50A	000	gR	12W	820
2020920-63	63A	00	gR	14W	1400
2020920-80	80A	00	gR	17W	2600
2020920-100	100A	00	gR	21W	4500
2020920-125	125A	00	aR	25W	9100
2020920-160	160A	00	aR	32W	15000
170M1570	200A	000	aR	37W	28000
170M1571	250A	000	aR	42W	51500
170M1572	315A	000	aR	52W	80500

Size 1

690VAC
ultra rapid
(gR, aR)

SIBA
Bussmann

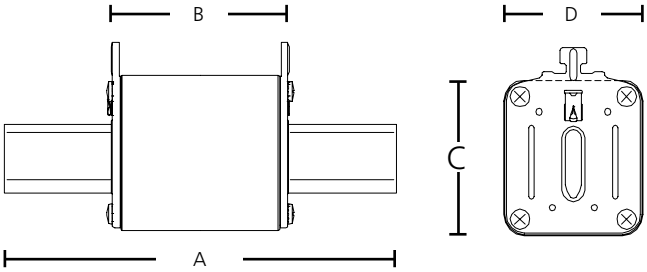
DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2021120	16-315	1	135	65	51.5	42
170M...	355-400	1	135	69	58	45

Class gR and aR for cable and line protection

PART NO.	AMP	CLASS	POWER LOSS	TOTAL I^2t @ 690V (A^2s)
2021120-16	16A	gR	-	-
2021120-20	20A	gR	-	-
2021120-25	25A	gR	-	-
2021120-32	32A	gR	-	-
2021120-40	40A	gR	8W	570
2021120-50	50A	gR	11W	1000
2021120-63	63A	gR	14W	1800
2021120-80	80A	gR	20W	3400
2021120-100	100A	aR	24W	4700
2021120-125	125A	aR	31W	7600
2021120-160	160A	aR	42W	14000
2021120-200	200A	aR	52W	21000
2021120-250	250A	aR	71W	36000
2021120-315	315A	aR	88W	76000
170M3818	355A	aR	55W	68500
170M3819	400A	aR	60W	105000

FUSE HOLDERS TO SUIT **Refer to pages 68**

NH Blade Ultra Rapid



Size 2

690VAC
ultra rapid (aR)

SIBA
Bussmann

DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2021220	125-250	2	150	65	51.5	42
2021220	315-450	2	150	65	59	53
170M...	500-700	2	150	69	59	55

Class aR for semiconductor protection

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 690V (A^2s)
2021220-80	80A	-	-
2021220-100	100A	-	-
2021220-125	125A	-	-
2021220-160	160A	42W	14000
2021220-200	200A	52W	21000
2021220-250	250A	71W	36000
2021220-315	315A	79W	76000
2021220-350	350A	85W	100000
2021220-400	400A	95W	145000
2021220-450	450A	100W	220000
170M5810	500A	75W	145000
170M5811	550A	80W	190000
170M5812	630A	90W	275000
170M5813	700A	95W	405000

Size 3

690VAC
ultra rapid (aR)

SIBA
Bussmann

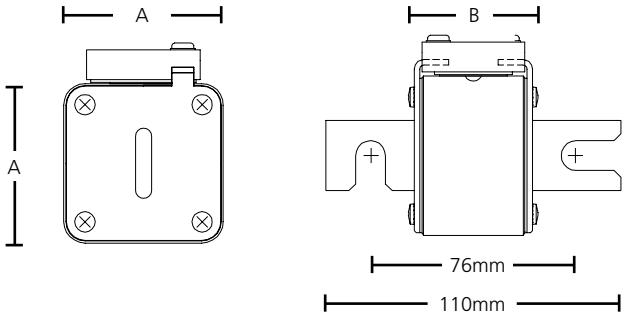
DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2021320	250-400	3	150	65	59	53
2021320	450-710	3	150	65	73.5	65
2021320	800	3	150	68	74	74
170M...	900-1000	3	150	68	74	76

Class aR for semiconductor protection

PART NO.	AMP	POWER LOSS	TOTAL I^2t @ 690V (A^2s)
2021320-250	250A	-	-
2021320-315	315A	79W	76000
2021320-350	350A	85W	100000
2021320-400	400A	95W	150000
2021320-450	450A	95W	220000
2021320-500	500A	100W	300000
2021320-550	550A	110W	400000
2021320-630	630A	130W	490000
2021320-710	710A	150W	610000
2021320-800	800A	120W	1050000
170M6813	900A	125W	670000
170M6814	1000A	-	945000

FUSE HOLDERS TO SUIT **Refer to pages 68**

DIN80 Square Body



Size 1

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2061232	63-900	51	47.5

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2061232-63	63A	690V
2061232-80	80A	690V
2061232-100	100A	690V
2061232-125	125A	690V
2061232-160	160A	690V
2061232-200	200A	690V
2061232-250	250A	690V
2061232-315	315A	690V
2061232-350	350A	690V

PART NO.	AMP	* VOLTAGE
2061232-400	400A	690V
2061232-450	450A	690V
2061232-500	500A	690V
2061232-550	550A	690V
2061232-630	630A	690V
2061232-700	700A	690V
2061232-800	800A	690V
2061232-900	900A	600V

Size 2

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2063232	400-1250	60	47.5

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2062232-400	400A	690V
2062232-450	450A	690V
2062232-500	500A	690V
2062232-550	550A	690V
2062232-630	630A	690V
2062232-700	700A	690V

PART NO.	AMP	* VOLTAGE
2062232-800	800A	690V
2062232-900	900A	690V
2062232-1000	1000A	690V
2062232-1100	1100A	600V
2062232-1250	1250A	600V

Size 3

690VAC*
ultra rapid (aR)

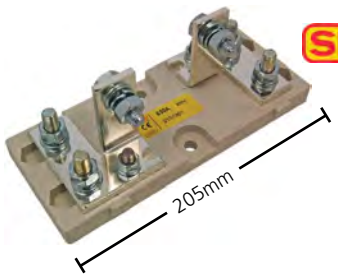
DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2063232	400-1250	73	49

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2063232-500	500A	690V
2063232-550	550A	690V
2063232-630	630A	690V
2063232-700	700A	690V
2063232-800	800A	690V
2063232-900	900A	690V

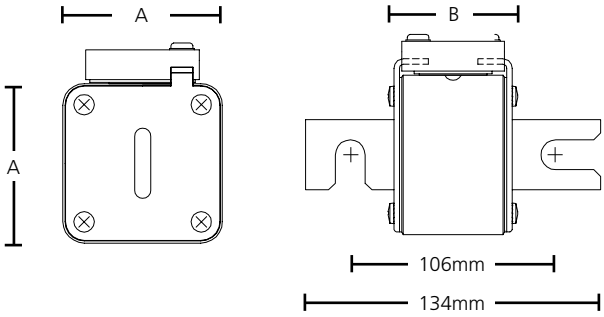
PART NO.	AMP	* VOLTAGE
2063232-1000	1000A	690V
2063232-1100	1100A	690V
2063232-1250	1250A	690V
2063232-1400	1400A	690V
2063232-1500	1500A	600V
2063232-1600	1600A	600V

DIN80 fuse base



PART NO.	DESCRIPTION	AMP	VOLTAGE	PACK SIZE
2131301	Fuse Base with Bolted. Connections DIN Type	**630A**	900V	1
2131302	Fuse Base with Bolted. Connections DIN Type	**1250A**	900V	1

DIN110 Square Body



Size 1

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2061532	63-900	51	47.5

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2061532-63	63A	690V
2061532-80	80A	690V
2061532-100	100A	690V
2061532-125	125A	690V
2061532-160	160A	690V
2061532-200	200A	690V
2061532-250	250A	690V
2061532-315	315A	690V
2061532-350	350A	690V

PART NO.	AMP	* VOLTAGE
2061532-400	400A	690V
2061532-450	450A	690V
2061532-500	500A	690V
2061532-550	550A	690V
2061532-630	630A	690V
2061532-700	700A	690V
2061532-800	800A	690V
2061532-900	900A	600V

Size 2

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2062532	250-1250	60	47.5

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2062532-200	200A	690V
2062532-250	250A	690V
2062532-315	315A	690V
2062532-350	350A	690V
2062532-400	400A	690V
2062532-450	450A	690V
2062532-500	500A	690V
2062532-550	550A	690V

PART NO.	AMP	* VOLTAGE
2062532-630	630A	690V
2062532-700	700A	690V
2062532-800	800A	690V
2062532-900	900A	690V
2062532-1000	1000A	690V
2062532-1100	1100A	600V
2062532-1250	1250A	600V

Size 3

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2063532	500-1600	73	49

Class aR for semiconductor protection

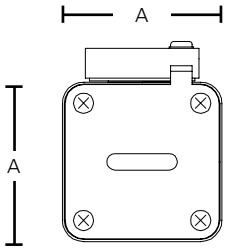
PART NO.	AMP	* VOLTAGE
2063532-500	500A	690V
2063532-550	550A	690V
2063532-630	630A	690V
2063532-700	700A	690V
2063532-800	800A	690V
2063532-900	900A	690V

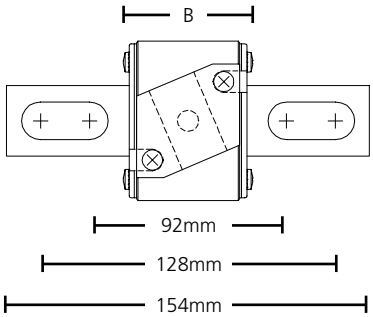
PART NO.	AMP	* VOLTAGE
2063532-1000	1000A	690V
2063532-1100	1100A	690V
2063532-1250	1250A	690V
2063532-1400	1400A	690V
2063532-1500	1500A	600V
2063532-1600	1600A	600V

DIN110 fuse base

PART NO.	DESCRIPTION	AMP	VOLTAGE	PACK SIZE
2132301	Fuse Base with Bolted. Connections DIN Type	**630A**	1400V	1
2132302	Fuse Base with Bolted. Connections DIN Type	**1250A**	1400V	1

American Blade Square Body





Size 1

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2061832	63-900	51	47.5

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2061832-63	63A	690V
2061832-80	80A	690V
2061832-100	100A	690V
2061832-125	125A	690V
2061832-160	160A	690V
2061832-200	200A	690V
2061832-250	250A	690V
2061832-315	315A	690V
2061832-350	350A	690V

PART NO.	AMP	* VOLTAGE
2061832-400	400A	690V
2061832-450	450A	690V
2061832-500	500A	690V
2061832-550	550A	690V
2061832-630	630A	690V
2061832-700	700A	690V
2061832-800	800A	690V
2061832-900	900A	600V

Size 2

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2062832	400-1250	60	47.5

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2062832-400	400A	690V
2062832-450	450A	690V
2062832-500	500A	690V
2062832-550	550A	690V
2062832-630	630A	690V
2062832-700	700A	690V

PART NO.	AMP	* VOLTAGE
2062832-800	800A	690V
2062832-900	900A	690V
2062832-1000	1000A	690V
2062832-1100	1100A	600V
2062832-1250	1250A	600V

Size 3

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2063832	500-1600	73	49

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2063832-500	500A	690V
2063832-550	550A	690V
2063832-630	630A	690V
2063832-700	700A	690V
2063832-800	800A	690V
2063832-900	900A	690V

PART NO.	AMP	* VOLTAGE
2063832-1000	1000A	690V
2063832-1100	1100A	690V
2063832-1250	1250A	690V
2063832-1400	1400A	690V
2063832-1500	1500A	600V
2063832-1600	1600A	600V

Fuse Base

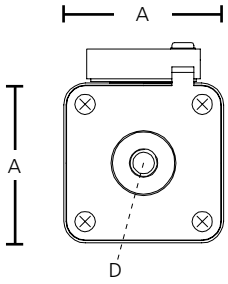
LSCR

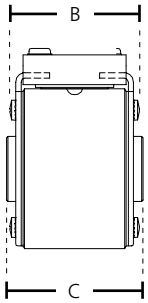
700VAC
modular fuse bases

Fuse holders to suit bolt in fuses

PART NO.	AMP
LSCR001	400A
LSCR002	800A

Flush End Square Body





Size 1

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2066132	63-900	1	51	47.5	51	M8

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2066132-63	63A	690V
2066132-80	80A	690V
2066132-100	100A	690V
2066132-125	125A	690V
2066132-160	160A	690V
2066132-200	200A	690V
2066132-250	250A	690V
2066132-315	315A	690V
2066132-350	350A	690V

PART NO.	AMP	* VOLTAGE
2066132-400	400A	690V
2066132-450	450A	690V
2066132-500	500A	690V
2066132-550	550A	690V
2066132-630	630A	690V
2066132-700	700A	690V
2066132-800	800A	690V
2066132-900	900A	600V

Size 2

690VAC*
ultra rapid (aR)

DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2067132	205-1250	2	60	47.5	51	M10

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2067132-250	250A	690V
2067132-350	350A	690V
2067132-400	400A	690V
2067132-450	450A	690V
2067132-500	500A	690V
2067132-550	550A	690V
2067132-630	630A	690V

PART NO.	AMP	* VOLTAGE
2067132-700	700A	690V
2067132-800	800A	690V
2067132-900	900A	690V
2067132-1000	1000A	690V
2067132-1100	1100A	600V
2067132-1250	1250A	600V

Size 3

690VAC*
ultra rapid (aR)

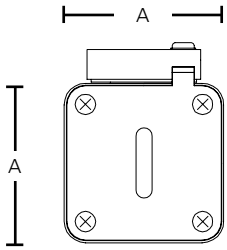
DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2068132	500-1600	3	73	49	51	M12
2068152	1800-2250	3	73	49	59	M12

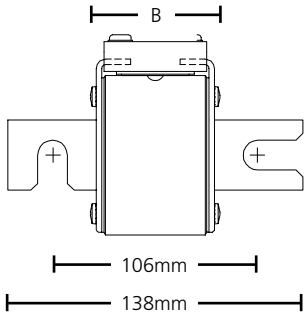
Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2068132-500	500A	690V
2068132-550	550A	690V
2068132-630	630A	690V
2068132-700	700A	690V
2068132-800	800A	690V
2068132-900	900A	690V
2068132-1000	1000A	690V
2068132-1100	1100A	690V

PART NO.	AMP	* VOLTAGE
2068132-1250	1250A	690V
2068132-1400	1400A	690V
2068132-1500	1500A	600V
2068132-1600	1600A	600V
2068152-1800	1800A	550V
2068152-2000	2000A	550V
2068152-2250	2250A	550V

DIN110 Square Body (1250V)





Size 1

SIBA

1250VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2071532	50-630	51	70.5

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2071532-50	50A	1250V
2071532-63	63A	1250V
2071532-80	80A	1250V
2071532-100	100A	1250V
2071532-125	125A	1250V
2071532-160	160A	1250V
2071532-200	200A	1250V
2071532-250	250A	1250V

PART NO.	AMP	* VOLTAGE
2071532-315	315A	1250V
2071532-350	350A	1250V
2071532-400	400A	1250V
2071532-450	450A	1250V
2071532-500	500A	1100V
2071532-550	550A	1100V
2071532-630	630A	1100V

Size 2

SIBA

1250VAC*
ultra rapid (aR)

DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2072532	250-800	60	70.5

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2072532-250	250A	1250V
2072532-280	280A	1250V
2072532-315	315A	1250V
2072532-350	350A	1250V
2072532-400	400A	1250V
2072532-450	450A	1250V

PART NO.	AMP	* VOLTAGE
2072532-500	500A	1250V
2072532-550	550A	1250V
2072532-630	630A	1250V
2072532-700	700A	1100V
2072532-800	800A	1100V

Size 3

SIBA

1250VAC*
ultra rapid (aR)

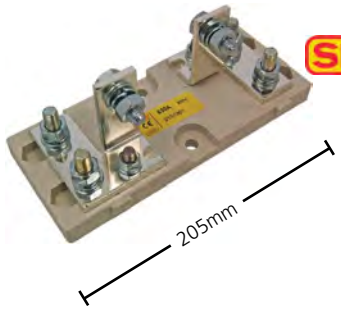
DIMENSIONS (mm)			
PART NO.	AMPS	A	B
2073532	315-1400	73	72

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2073532-315	315A	1250V
2073532-350	350A	1250V
2073532-400	400A	1250V
2073532-450	450A	1250V
2073532-500	500A	1250V
2073532-550	550A	1250V
2073532-630	630A	1250V

PART NO.	AMP	* VOLTAGE
2073532-700	700A	1250V
2073532-800	800A	1250V
2073532-900	900A	1000V
2073532-1000	1000A	1000V
2073532-1100	1100A	1000V
2073532-1250	1250A	900V
2073532-1400	1400A	900V

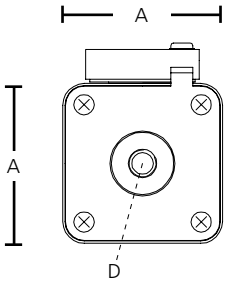
DIN110 fuse base

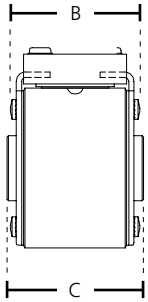


SIBA

PART NO.	DESCRIPTION	AMP RATING	VOLTAGE RATING	PACK SIZE
2132301	Fuse Base with Bolted. Connections DIN Type	**630A**	1400V	1
2132302	Fuse Base with Bolted. Connections DIN Type	**1250A**	1400V	1

Ultra Rapid Flush End (1250V)





Size 1

SIBA

1250VAC*
ultra rapid (aR)

DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2076132	50-630	1	51	70.5	73.5	M8

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2076132-63	63A	1250V
2076132-80	80A	1250V
2076132-100	100A	1250V
2076132-125	125A	1250V
2076132-160	160A	1250V
2076132-200	200A	1250V
2076132-250	250A	1250V

PART NO.	AMP	* VOLTAGE
2076132-315	315A	1250V
2076132-350	350A	1250V
2076132-400	400A	1250V
2076132-450	450A	1250V
2076132-500	500A	1100V
2076132-550	550A	1100V
2076132-630	630A	1100V

Size 2

SIBA

1250VAC*
ultra rapid (aR)

DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2077132	250-800	2	60	70.5	73.5	M10

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2077132-250	250A	1250V
2077132-280	280A	1250V
2077132-315	315A	1250V
2077132-350	350A	1250V
2077132-400	400A	1250V
2077132-450	450A	1250V

PART NO.	AMP	* VOLTAGE
2077132-500	500A	1250V
2077132-550	550A	1250V
2077132-630	630A	1250V
2077132-700	700A	1100V
2077132-800	800A	1100V

Size 3

SIBA

1250VAC*
ultra rapid (aR)

DIMENSIONS (mm)						
PART NO.	AMPS	SIZE	A	B	C	D
2078132	315-1400	3	73	72	73.5	M12
2078152	1100-1600	3	73	82	91	M12

Class aR for semiconductor protection

PART NO.	AMP	* VOLTAGE
2078132-315	315A	1250V
2078132-350	350A	1250V
2078132-400	400A	1250V
2078132-450	450A	1250V
2078132-500	500A	1250V
2078132-550	550A	1250V
2078132-630	630A	1250V
2078132-700	700A	1250V
2078132-800	800A	1250V

PART NO.	AMP	* VOLTAGE
2078132-1000	1000A	1000V
2078132-1100	1100A	1000V
2078132-1250	1250A	900V
2078132-1400	1400A	900V
2078152-1100	1100A	1250V
2078152-1250	1250A	1250V
2078152-1400	1400A	1000V
2078152-1600	1600A	900V

DI – 12.5mm Diameter

1000201

500VAC
fast (gG)
DI, diazed
(prev E16F)

Class gG for cable and line protection

1000201 BOTTLE NECK DIMENSIONS	
AMPS	A (mm)
500mA-6A	6
10A	8
16A	10
20A	12
25A	14

PART NO.	AMP	INDICATOR
1000201-500MA	500mA	WHITE
1000201-1	1A	RED
1000201-2	2A	PINK
1000201-4	4A	BROWN
1000201-6	6A	GREEN
1000201-10	10A	RED
1000201-16	16A	GREY
1000201-20	20A	BLUE
1000201-25	25A	YELLOW

1000207

500VAC
ultra rapid (gR)
DI, silized
(prev E16UR)

Class gR for semiconductor protection

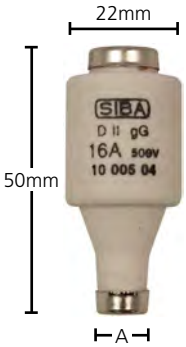
1000207 BOTTLE NECK DIMENSIONS	
AMPS	A (mm)
2A-6A	6
10A	8
16A	10
20A	12
25-30A	14

PART NO.	AMP	INDICATOR
1000207-2	2A	PINK
1000207-4	4A	BROWN
1000207-6	6A	GREEN
1000207-10	10A	RED
1000207-16	16A	GREY
1000207-20	20A	BLUE
1000207-25	25A	YELLOW
1000207-30	30A	GOLD

DII - 22mm Diameter

1000504

500VAC
fast (gG)
DII, diazed
(prev E27F)



Class gG for cable and line protection

1000504 BOTTLE NECK DIMENSIONS	
AMPS	A (mm)
500mA-6A	6
10A	8
16A	10
20A	12
25A	14

PART NO.	AMP	INDICATOR
1000504-500MA	500mA	WHITE
1000504-1	1A	GREY
1000504-1.6	1.6A	RED
1000504-2	2A	PINK
1000504-4	4A	BROWN
1000504-6	6A	GREEN
1000504-10	10A	RED
1000504-16	16A	GREY
1000504-20	20A	BLUE
1000504-25	25A	YELLOW

1000507

500VAC
ultra rapid (gR)
DII, silized
(prev E27UR)

Class gR for semiconductor protection

1000507 BOTTLE NECK DIMENSIONS	
AMPS	A (mm)
2A-6A	6
10A	8
16A	10
20A	12
25-30A	14

PART NO.	AMP	INDICATOR
1000507-2	2A	PINK
1000507-4	4A	BROWN
1000507-6	6A	GREEN
1000507-10	10A	RED
1000507-16	16A	GREY
1000507-20	20A	BLUE
1000507-25	25A	YELLOW
1000507-30	30A	GOLD

DIII – 27mm Diameter

1000704

500VAC
fast (gG)
DIII, diazed
(prev E33F)

Class gG for cable and line protection

1000704 BOTTLE NECK DIMENSIONS	
AMPS	A (mm)
35A	16
50A	18
63A	20

PART NO.	AMP	INDICATOR
1000704-35	35A	BLACK
1000704-50	50A	WHITE
1000704-63	63A	COPPER

1000707

500VAC
ultra rapid (gR)
DIII, silized
(prev E33UR)

Class gR for semiconductor protection

1000707 BOTTLE NECK DIMENSIONS	
AMPS	A (mm)
35A	16
50A	18
63A	20

PART NO.	AMP	INDICATOR
1000707-35	35A	BLACK
1000707-50	50A	WHITE
1000707-63	63A	COPPER

DIV - 33mm Diameter

1000904

500VAC
fast (gG)
DIV, diazed
(prev E44F)

Class gG for cable and line protection

1000904 BOTTLE NECK DIMENSIONS	
AMPS	A (mm)
80A	5
100A	7

PART NO.	AMP	INDICATOR
1000904-80	80A	SILVER
1000904-100	100A	RED

1000907

ultra rapid (gR)
DIV, silized
(prev E44UR)

Class gR for semiconductor protection

1000907 BOTTLE NECK DIMENSIONS	
AMPS	A (mm)
80A	5
100A	7

PART NO.	AMP	INDICATOR
1000907-80	80A	SILVER
1000907-100	100A	RED

Neozed

1002704
1002804
1002904

400VAC/250VDC
fast, (gG)
D01, D02, D03

Class gG for cable and line protection

1002704 & 1002904 BOTTLE NECK DIMENSIONS			
	AMPS	A	B
D01 (E14)	1-16A	36	11
D02 (E18)	20-63A	36	15
D03 (M30x2)	80-100A	43	24

PART NO.	SIZE	AMP	INDICATOR
1002704-1	D01	1A	-
1002704-2	D01	2A	PINK
1002704-4	D01	4A	BROWN
1002704-6	D01	6A	GREEN
1002704-10	D01	10A	RED
1002704-16	D01	16A	GREY
1002804-20	D02	20A	BLUE
1002804-25	D02	25A	YELLOW
1002804-35	D02	35A	BLACK
1002804-50	D02	50A	WHITE
1002804-63	D02	63A	COPPER
1002904-80	D03	80A	SILVER
1002904-100	D03	100A	RED

1002707
1002807
1002907

440VAC
ultra rapid (gR)
D01, D02, D03

Class gR for semiconductor protection

1002707, 1002807 & 1002907 BOTTLE NECK DIMENSIONS			
	AMPS	A	B
D01 (E14)	1-16A	36	11
D02 (E18)	20-63A	36	15
D03 (M30x2)	80-100A	43	24

PART NO.	SIZE	AMP	INDICATOR
1002707-2	D01	2A	PINK
1002707-4	D01	4A	BROWN
1002707-6	D01	6A	GREEN
1002707-10	D01	10A	RED
1002707-16	D01	16A	GREY
1002807-20	D02	20A	BLUE
1002807-25	D02	25A	YELLOW
1002807-35	D02	35A	BLACK
1002807-50	D02	50A	WHITE
1002807-63	D02	63A	COPPER
1002907-80	D03	80A	SILVER
1002907-100	D03	100A	RED

Miscellaneous

RL1

FuseMaster

380VAC
Chinese standard

Fast acting for general applications (Usually found in Chinese equipment).

PLEASE NOTE: Dimensions can vary by up to 3mm.

PART NO.	AMP
RL1-2	2A
RL1-4	4A
RL1-6	6A

PART NO.	AMP
RL1-10	10A
RL1-15	15A

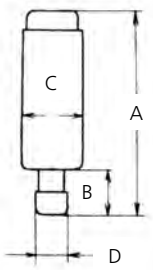
BLA

Fuji Electric

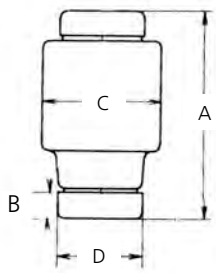
600VAC/DC
Japanese standard

Fast acting for general applications

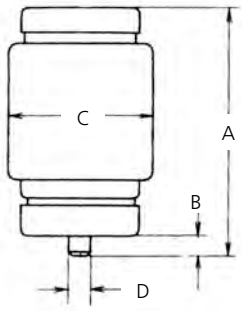
PART NO.	AMP	INDICATOR	A (mm)	B (mm)	C (mm)	D (mm)
BLA-3	3A	PINK	50	10	13	8
BLA-5	5A	BROWN	50	10	13	8
BLA-10	10A	RED	50	10	13	8
BLA-15	15A	GREY	50	10	13	10
BLA-20	20A	BLUE	50	10	13	10
BLA-30	30A	VIOLET	50	10	13	14
BLA-40	40A	BLACK	50	10	27	16
BLA-60	60A	LIGHT RED	50	10	27	20
BLA-75	75A	SILVER	63	5.4	34	5
BLA-100	100A	RED	63	5.4	34	8
BLA-125	125A	YELLOW	63	5.4	47	5
BLA-150	150A	LIGHT RED	63	5.4	47	8
BLA-200	200A	BLUE	63	5.4	47	10
BLA-250	250A	GREEN	63	5.4	61	5
BLA-300	300A	WHITE	63	5.4	61	8
BLA-400	400A	BLACK	63	5.4	61	10



3A-30A



40A-60A



75A-400A

Automotive

MINI

32VDC

Fast acting for general DC applications

PART NO.	AMP	COLOUR
MINI-2	2A	GREY
MINI-3	3A	VIOLET
MINI-4	4A	PINK
MINI-5	5A	TAN
MINI-7.5	7.5A	BROWN

PART NO.	AMP	COLOUR
MINI-10	10A	RED
MINI-15	15A	BLUE
MINI-20	20A	YELLOW
MINI-25	25A	CLEAR
MINI-30	30A	GREEN

AUTO

32VDC

Fast acting for general DC applications

PART NO.	AMP	COLOUR
AUTO-1	1A	BLACK
AUTO-2	2A	GREY
AUTO-3	3A	VIOLET
AUTO-4	4A	PINK
AUTO-5	5A	TAN
AUTO-7.5	7.5A	BROWN
AUTO-10	10A	RED

PART NO.	AMP	COLOUR
AUTO-15	15A	BLUE
AUTO-20	20A	YELLOW
AUTO-25	25A	CLEAR
AUTO-30	30A	GREEN
AUTO-35	35A	BLUE/GREEN
AUTO-40	40A	ORANGE

MAXI

32VDC

Slow (time delay) for general DC applications

PART NO.	AMP	COLOUR
MAXI-20	20A	YELLOW
MAXI-25	25A	GREY
MAXI-30	30A	GREEN
MAXI-35	35A	BROWN
MAXI-40	40A	ORANGE

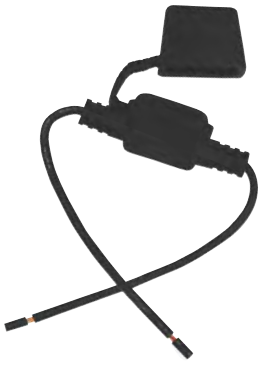
PART NO.	AMP	COLOUR
MAXI-50	50A	RED
MAXI-60	60A	BLUE
MAXI-70	70A	TAN
MAXI-80	80A	CLEAR

Auto Fuses Holders

FHM0001

in-line holder
for MINI fuse

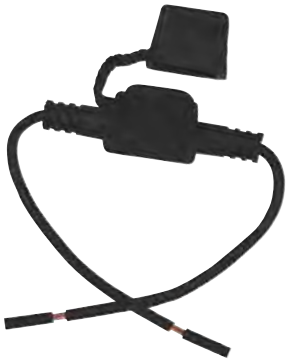
20A 32VDC rated in-line fuse holder
with splash proof cover



FHAC0001

in-line holder
for AUTO fuse

20A 32VDC rated in-line fuse holder
with splash proof cover



MAHC0001

in-line holder
for MAXI fuse

60A 32VDC rated in-line fuse holder
with splash proof cover

DC Voltage

MIDI

32VDC
slow

30mm

Slow acting for DC applications

PART NO.	AMP	COLOUR
MIDI-30	30A	ORANGE
MIDI-40	40A	GREEN
MIDI-50	50A	RED
MIDI-60	60A	YELLOW
MIDI-70	70A	BROWN

PART NO.	AMP	COLOUR
MIDI-80	80A	WHITE
MIDI-100	100A	BLUE
MIDI-125	125A	PINK
MIDI-150	150A	GREY

FUSE HOLDERS TO SUIT **See Below**

MEGA

32VDC
slow

51mm

Slow acting for DC applications

PART NO.	AMP	COLOUR
MEGA-40	40A	–
MEGA-60	60A	–
MEGA-80	80A	RED
MEGA-100	100A	YELLOW
MEGA-125	125A	GREEN
MEGA-150	150A	ORANGE
MEGA-175	175A	WHITE

PART NO.	AMP	COLOUR
MEGA-200	200A	BLUE
MEGA-225	225A	TAN
MEGA-250	250A	PINK
MEGA-300	300A	GREY
MEGA-400	400A	PURPLE
MEGA-500	500A	BROWN

FUSE HOLDERS TO SUIT **See Below**

DC Fuse Holders

498900

holder for MIDI fuse

32VDC rated fuse holder

298-1001

holder for MEGA fuse

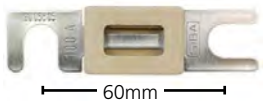
Single assembly fuse holder.
Also available in dual and triple assembly

Forklift and DC

9005805

SIBA

80VDC
fast



Fast acting for general DC applications

PART NO.	AMP	PART NO.	AMP
9005805-50	50A	**9005805-200**	200A
9005805-63	63A	**9005805-250**	250A
9005805-80	80A	**9005805-300**	300A
9005805-100	100A	**9005805-325**	325A
9005805-125	125A	**9005805-355**	355A
9005805-160	160A	**9005805-425**	425A
9005805-175	175A	**9005805-500**	500A

9005909

SIBA

24VDC
fast

Fast acting for general DC applications

PART NO.	AMP	PART NO.	AMP
9005909-30A	30A	**9005909-100A**	100A
9005909-50A	50A	**9005909-150A**	150A
9005909-80A	80A		

CNN

Littelfuse

48VDC
very fast

Very fast acting for general DC applications

PART NO.	AMP	PART NO.	AMP
CNN35	35A	**CNN225**	225A
CNN40	40A	**CNN250**	250A
CNN50	50A	**CNN275**	275A
CNN60	60A	**CNN300**	300A
CNN80	80A	**CNN325**	325A
CNN90	90A	**CNN350**	350A
CNN100	100A	**CNN400**	400A
CNN125	125A	**CNN500**	500A
CNN150	150A	**CNN600**	600A
CNN175	175A	**CNN700**	700A
CNN200	200A	**CNN800**	800A

CNL

Littelfuse

32VDC
fast

Fast acting for general DC applications

PART NO.	AMP	PART NO.	AMP
CNL35	35A	**CNL225**	225A
CNL40	40A	**CNL250**	250A
CNL50	50A	**CNL275**	275A
CNL60	60A	**CNL300**	300A
CNL80	80A	**CNL325**	325A
CNL90	90A	**CNL350**	350A
CNL100	100A	**CNL400**	400A
CNL125	125A	**CNL500**	500A
CNL150	150A	**CNL600**	600A
CNL175	175A	**CNL700**	700A
CNL200	200A	**CNL800**	800A

FUSE HOLDERS TO SUIT **Refer to pages 87**

Forklift and DC Fuses and Holders

CCK

Littelfuse

130VDC*
time delay

CCK DIMENSIONS (mm)		
AMPS	A	B
1-15	56	13
20-30	62	13
35-60	76	19
70-120	88	25.4
140-200	91	25.4
225-300	97	25.4

Slow acting for general DC applications

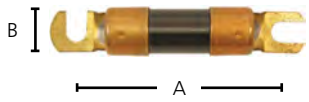
PART NO.	AMP	* VOLTAGE
CCK1	1A	130V
CCK2	2A	130V
CCK10	10A	130V
CCK15	15A	130V
CCK20	20A	130V
CCK25	25A	130V
CCK30	30A	130V
CCK35	35A	130V
CCK40	40A	130V
CCK50	50A	130V
CCK60	60A	130V
CCK70	70A	130V

PART NO.	AMP	* VOLTAGE
CCK75	75A	130V
CCK80	80A	130V
CCK100	100A	130V
CCK120	120A	72V
CCK140	140A	72V
CCK150	150A	72V
CCK160	160A	72V
CCK175	175A	72V
CCK200	200A	72V
CCK225	225A	48V
CCK250	250A	48V
CCK300	300A	48V

CCL

Littelfuse

125VDC
time delay



Slow acting for general DC applications

PART NO.	AMP
CCL30	30A
CCL35	35A
CCL40	40A
CCL50	50A

PART NO.	AMP
CCL60	60A
CCL80	80A
CCL100	100A
CCL120	120A

CCL DIMENSIONS (mm)		
AMPS	A	B
30-60	62.33	12.95
80-120	68.58	19.05

CNN/CNL Holder

80VDC
fuse holder

Fuse holder to suit DC Fuses

PART NO.	AMP	TO SUIT
CNN/CNL Holder	250A	To suit 9005805, CNN, CNL fuses

9103001

SIBA

80VDC
fuse holder

Fuse holder to suit DC fuses.

PART NO.	AMP	TO SUIT
9103001	425A	To suit 9005805, CNN, CNL fuses

FUSECO

Back Up Performance (DIN Standard)

SIBA

VOLTAGE RATING	BODY LENGTH (mm)	SIBA PART NO.	AMP RATING	SIBA DIAMETER	BUSSMANN PART NO.	BUSSMANN DIAMETER	GEC PART NO.	GEC DIAMETER
3/7.2 kV	192	**3000213 / amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50	53	3.6ADOSJ amp	50.8	45DB72VampP	56
	192	**3001013 / amp**	63, 80, 100, 125	67	3.6WDOSJ amp	50.8	45DB72VampP	65
	192	**3001813 / amp**	160	85	3.6WFOSJ amp	76.2	45DB72VampP	88
	192	**3001814 / amp**	200, 250	85	3.6WFOSJ amp	76.2	45DB72VampP	88
	292	3009813 / amp	6.3, 10, 16, 20, 25, 31.5, 40, 50	53	3.6ADLSJ amp 7.2SDLSJ amp	50.8 50.8	FDw7.2-amp-2-6	63
	292	3009913 / amp	63, 80, 100, 125	67	7.2SDLSJ amp 7.2SFLSJ amp	50.8 76.2	FDw7.2-amp-2-6 FDw7.2-amp-2-8	63 88
	292	3010013 / amp	160	85	7.2SFLSJ amp	76.2	-	-
	292	3010014 / amp	200, 250, 315, 355	85	-	-	-	-
	442	3010913 / amp	100, 125	67	-	-	FDw7.2-amp-4-6 FDw7.2-amp-4-8	63 88
	442	3011013 / amp	160	85	-	-	FDw7.2-amp-4-8	88
	442	3011014 / amp	200, 250, 315, 355, 400, 500	85	-	-	-	-
6/12 kV	192	3011913 / amp	6.3, 10, 16	53	-	-	-	-
	192	3026713 / amp	20, 25, 31.5, 40, 50, 63	67	-	-	-	-
	292	**3000413 / amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50	53	12SDLSJ amp 12SFLSJ amp	50.8 76.2	45DB120VampP FDw12-amp-2-6 FDw12-amp-2-8	56 63 88
	292	**3001213 / amp**	63, 80, 100, 125	67	12SDLSJ amp 12SFLSJ amp 12SKLSJ amp	50.8 76.2 76.2	45DB120VampP FDw12-amp-2-6 FDw12-amp-2-8	56/65/88 63 88
	292	**3002013 / amp**	160	85	12SKLSJ amp 12SXLEJ1 amp	76.2 88.0	45DB120VampP	88
	292	**3002014 / amp**	200, 250	85	12SKLSJ amp 12SXLEJ2 amp	76.2 88.0	45DB120VampP	88
	442	3010113 / amp	6.3, 10, 16, 20, 25, 31.5, 40, 50	53	-	-	-	-
	442	3010213 / amp	63, 80, 100, 125	67	12THMEJ amp	64	FDw12-amp-4-8	88
	442	3010313 / amp	160	85	12TFMSJ amp	76	FDw12-amp-4-8	88
	442	3010314 / amp	200, 250	85	-	-	-	-
	537	3021113 / amp	100, 125, 160	85	-	-	-	-
	537	3021114 / amp	200, 250, 315	85	-	-	-	-

Back Up Performance (DIN Standard)

VOLTAGE RATING	BODY LENGTH (mm)	SIBA PART NO.	AMP RATING	SIBA DIAMETER	BUSSMANN	BUSSMANN DIAMETER	GEC	GEC DIAMETER
10/24 kV	292	3018013 / amp	6.3, 10, 16	53	-	-	-	-
	292	3022513 / amp	20, 25, 31.5, 40, 50, 63	67	-	-	-	-
	442	**3000613 / amp**	6.3, 10, 16, 20, 25, 31.5, 40	53	24SDMSJ amp 24SFMSJ amp	50.8 76.2	45DB240VampP FDw24-amp-4-6	56 63
	442	**3001413 / amp**	50, 63, 80	67	24SHMEJ amp 24SFMSJ amp	63.5 76.2	45DB240VampP FDw24-amp-4-6 FDw24-amp-4-8	56 63 88
	442	**3002213 / amp**	100, 125, 160	85	24SHMEJ amp 24SKMEJ amp	63.5 76.2	45DB240VampP FDw24-amp-4-8	78 88
	442	**3002214 / amp**	160, 200	85	24SXMEJ160	88	45DB240VampP	88
	537	3020313 / amp	6.3, 10, 16, 20, 25, 31.5, 40	53	-	-	-	-
	537	3020413 / amp	50, 63, 80	67	-	-	-	-
	537	3019613 / amp	100, 125, 160	85	-	-	-	-
	537	3019614 / amp	200	85	-	-	-	-
20/36 kV	292	3045411 / amp	6.3, 10, 16	67	-	-	-	-
	442	3018113 / amp	6.3, 10, 16	53	-	-	-	-
	442	3029513 / amp	20, 25	67	-	-	-	-
	537	**3000813 / amp**	6.3, 10, 16, 20, 25	53	36SDQSJ amp	50.8	45DB360VampPD FDw36-amp-5-6	56 63
	537	**3001613 / amp**	31.5, 40	67	36SFQSJ amp	76.2	45DB360VampPD FDw36-amp-5-8	65 88
	537	**3002413 / amp**	40, 50, 63, 80, 100	85	36SFQSJ amp 36SXQEJ amp	76.2 88	45DB360VampPD FDw36-amp-5-8	65 88

Full Range Performance (DIN Standard)

VOLTAGE RATING	BODY LENGTH (mm)	SIBA PART NO.	AMP RATING	SIBA DIAMETER	BUSSMANN	BUSSMANN DIAMETER
6/12 kV	292	**3000403 / amp**	6.3, 10, 16, 20, 25, 31.5, 40	53	12FDLSJ amp 12FFLSJ amp	50.8 76.2
	292	**3001203 / amp**	50, 63	67	12FFLSJ amp	76.2
	292	**3002003 / amp**	80, 100	85	12FFLSJ amp 12FXLSJ amp	76.2 88
10/24 kV	442	**3000603 / amp** **3001403 / amp**	6.3, 10, 16, 20, 25, 31.5 40, 45, 50A	53 67	24FDMSJ amp 24FFMSJ amp	50.8 76.2

FUSECO

General Purpose Performance (DIN Standard)

SIBA

VOLTAGE RATING	BODY LENGTH (mm)	SIBA PART NO.	AMP RATING	SIBA DIAMETER
6/12 kV	292	**3000493 / amp**	6.3	53
	292	**3001293 / amp**	8, 10, 16, 20, 25, 31.5, 40	67
	292	**3002093 / amp**	50, 63, 80, 100	85
10/24 kV	442	**3000693 / amp**	6.3	53
	442	**3001493 / amp**	10, 16, 20, 25	67
	442	**3002293 / amp**	31.5, 40	85

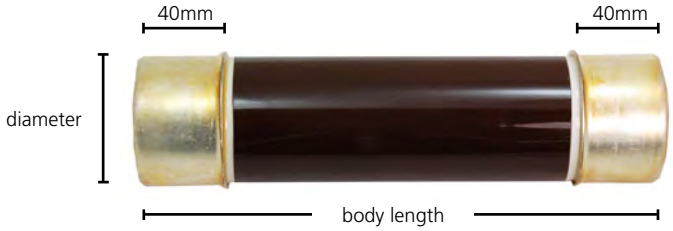
Motor Protection (DIN Standard)

SIBA

VOLTAGE RATING	BODY LENGTH (mm)	SIBA PART NO.	Amp Rating	SIBA DIAMETER	BUSSMANN	BUSSMANN DIAMETER
3.6 kV	192	Contact Fuseco	50, 63, 80, 100, 125	-	3.6WDOSJ amp	50.8
	192	Contact Fuseco	160, 200	-	3.6WFOSJ amp	76.2
	292	**3020153 / amp**	50, 63, 80, 100	53	3.6WDLSJ amp	50.8
	292	**3020253 / amp**	125, 160	67	3.6WDLSJ amp 3.6WFLSJ amp	50.8 76.2
	292	**3020054 / amp**	200, 224, 250, 315	85	3.6WFLSJ amp 3.6WKLSJ amp	76.2 76.2
	292	**3020554 / amp ***	355, 400, 450	2 x 85	-	-
7.2 kV	442	**3010853 / amp**	50, 63, 80, 100	53	7.2WFMSJ amp	76.2
	442	**3010953 / amp**	125, 160	67	7.2WFMSJ amp	76.2
	442	**3011054 / amp**	200, 224, 250, 315	85	7.2WKMSJ amp	76.2
	442	**3011154 / amp ***	355, 400, 450	2 x 85	-	-
12 kV	442	**3010153 / amp**	50, 63	53	-	-
	442	**3010253 / amp**	80, 100, 125	67	-	-
	442	**3010353 / amp**	160	85	-	-
	442	**3010354 / amp**	200	85	-	-

* Double Body

Oil Fuses (British Standard)



SIBA

VOLTAGE RATING	BODY LENGTH (mm)	SIBA PART NO.	AMP RATING	SIBA DIAMETER	BUSSMANN	BUSSMANN DIAMETER	GEC	GEC DIAMETER
3.6 kV	254	Contact Fuseco	6.3, 10, 16, 20, 25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200	-	3.6OEFMA amp	63.5	-	-
	359	Contact Fuseco	100, 125, 160, 200	-	3.6OEGMA amp	63.5	-	-
	359	Contact Fuseco	250	-	3.6OLGMA amp	63.5	-	-
7.2 kV	254	**3013236 / amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50, 63, 80, 100, 112	63.5	7.2OEFMA amp	63.5	KSBXO amp	63.5
	359	**3023436 / amp**	125, 140	63.5	7.2OHGMA amp	63.5	KSMXO amp	63.5
12 kV	254	**3014436 / amp**	6.3, 10, 16, 20, 25, 31.5, 35, 40, 50, 56, 63, 71, 80, 90, 100	63.5	12OEFMA amp 12OHFMA amp	63.5	KEBXO amp	63.5
	359	**3023736 / amp**	6.3, 10, 16, 20, 25, 31.5, 35, 40, 45, 50, 63, 80, 90, 100, 125 (145A discontinued)	63.5	12OHGMA amp 12OLGMA amp	63.5	KEMXO amp	63.5
24 kV	359	**3015636 / amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50, 63, 80	63.5	24OEGMA amp	63.5	-	-

Motor Protection (British Standard)

SIBA

VOLTAGE RATING	BODY LENGTH (mm)	SIBA PART NO.	AMP RATING	SIBA DIAMETER	BUSSMANN	BUSSMANN DIAMETER	GEC	GEC DIAMETER
3.6 kV	254	**3026956 / amp**	50, 63, 80, 100, 125, 160, 200, 224, 250, 315	76	3.6WDFHO amp 3.6WFFHO amp 3.6WKFHO amp	50.8 76.2 76.2	K81PEX amp K81PRX amp	80
7.2 kV	403	**3027156 / amp**	50, 63, 80, 100, 125, 160, 200, 224, 250, 315	76	7.2WFNHO amp 7.2WKNHO amp	76.2 76.2	K81SDX amp	80
	403	**3027256 / amp***	315, 355, 400, 450	2 x 76	-	-	-	-

* Double Body

Ferrule Air Fuses – Backup Protection (British Standard)

Bussmann

VOLTAGE RATING	BODY LENGTH (mm)	BUSSMANN PART NO.	AMP RATING	BUSSMANN DIAMETER
3.6 kV	254	**3.6ADFHA amp**	6.3, 10, 16, 20, 25, 31.5, 40	50.8
	359	**3.6ADGHA amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50, 63, 80, 100	50.8
	359	**3.6WFGHO amp**	125, 160, 200, 250	76.2
	359	**3.6WKGHO amp**	315, 355, 400, 450	76.2
7.2 kV	254	**7.2ADFHA amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50, 63	50.8
	254	**7.2AFFHA amp**	80, 100	76.2
	359	**7.2BDGHA amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50, 63, 80	50.8
	359	**7.2BFGHA amp**	90, 100, 125, 140, 160	76.2
12 kV	254	**12ADFHA amp**	6.3, 10, 16, 20, 25, 31.5	50.8
	254	**12AFFHA amp**	40, 50, 63	76.2
	359	**12BDGHA amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50	50.8
	359	**12BFGHA amp**	56, 63, 71, 80, 90, 100	76.2
	359	**12AKGHA amp**	112, 125	76.2
24 kV	564	**24ADIHA amp**	3.15, 6.3, 10, 16, 20, 25, 31.5, 35.5	50.8
	564	**24AFIHA amp**	6.3, 10, 16, 20, 25, 31.5, 40, 50, 56, 63, 71, 80, 90	76.2
36 kV	564	**36ADIHA amp**	3.15, 5, 6.3, 10, 16, 20, 25, 31.5	50.8
	564	**36AFIHA amp**	3.15, 6.3, 10, 16, 25, 40	76.2
	914	**36AFKHA amp**	50, 63, 71	76.2
72.5 kV	914	**72.5AFKHA amp**	3.15, 5, 6.3, 10, 16, 20, 25, 31.5, 40	76.2

Expulsion Drop Out Fuses (Class K)

NGK

VOLTAGE RATING	BODY LENGTH (mm)	PART NO.	Amp Rating	PROLINK Equivalent
36 kV	680	**ZXC705-01BK37**	1	Contact Fuseco
	680	**ZXC705-02BK37**	2	7501638
	680	**ZXC705-03BK37**	3.15	7501639
	680	**ZXC705-05BK37**	5	7501640
	680	**ZXC705-06BK37**	6	Contact Fuseco
	680	**ZXC705-08BK37**	8	7501642
	680	**ZXC705-10BK37**	10	7501643
	680	**ZXC705-12BK37**	12	Contact Fuseco
	680	**ZXC705-16BK37**	16	7501644
	680	**ZXC705-20BK37**	20	7501645
	680	**ZXC705-25BK37**	25	7501646
	680	**ZXC705-31BK37**	31.5	7501647
	680	**ZXC705-40BK37**	40	7501648
	680	**ZXC705-50BK37**	50	7501649
	680	**ZXC705-63BK37**	63	7501664
	680	**ZXC705-80BK37**	80	7501665
	680	**ZXC705-100BK37**	100	7501666

VT Fuses

SIBA

VOLTAGE RATING	BODY LENGTH (mm)	SIBA PART NO.	AMP RATING	SIBA DIAMETER	BUSSMANN	BUSSMANN DIAMETER
3/7.2 kV	142	**3038311 / amp**	0.5, 1, 2, 3, 5	24	7.2VTBNN / 7.2ABWNA	25.4
	142	Contact Fuseco	–	–	7.2OBWNA	25.4
	195	**3037711 / amp**	0.5, 1, 2, 3	24	7.2VTDNN / 7.2ABCNA	25.4
	195	Contact Fuseco	–	-	7.2OBCNA	25.4
	220	**3037111 / amp**	0.5, 1, 2, 3, 4, 5	39.6	–	–
6/12 kV	160	**3044011 / amp**	0.1, 0.3, 0.5, 0.6, 1, 2, 3.15, 4, 5, 6.3	22	–	–
	195	**3037811 / amp**	0.5, 1, 2, 3, 4	24	12ABCNA	25.4
	195	Contact Fuseco	–	–	12OBCNA	25.4
	220	**3037211 / amp**	0.5, 1, 2, 3, 4, 5	39.6	–	–
8.3/15.5 kV	327	**3043511 / amp**	0.5, 1, 2, 3, 4, 5, 7	39.6	–	–
10/17.5 kV	220	**3044411 / amp**	0.5, 1, 2, 3	39.6	–	–
	340	**3037311 / amp**	0.5, 1, 2, 3, 4, 5	39.6	–	–
	359	**3037911 / amp**	0.5, 1, 2, 3	24	17.5ABGNA	25.4
	359	Contact Fuseco	–	–	17.5OBGNA	25.4
10/24 kV	250	**3044311 / amp**	0.1, 0.3, 0.5, 0.6, 1, 2	22	–	–
	280	**3044111 / amp**	0.1, 0.3, 0.5, 0.6, 1, 2, 3.15, 4, 5, 6.3	22	–	–
	310	**3050611 / amp**	0.5, 1, 2, 3	24	–	–
	340	**3037411 / amp**	0.5, 1, 2, 3, 4, 5	39.6	–	–
	359	**3038011 / amp**	0.5, 1, 2, 3	24	24ABGNA	25.4
	359	Contact Fuseco	–	–	24OBGNA	25.4
25.8 kV	326	**3052711 / amp**	0.5, 1, 2	39.6	–	–
20/36 kV	359	**3038111 / amp**	0.5, 1, 2, 3	24	36ABGNA	25.4
	359	Contact Fuseco	–	–	36OBGNA	25.4
	418	**3044211 / amp**	0.1, 0.3, 0.5, 0.6, 1, 2	36.5	–	–
	440	**3037511 / amp**	0.5, 1, 2, 3	39.6	–	–

VT Fuse Clips

SIBA

PART NO.	TO SUIT VT FUSE DIAMETER
6100201.3	22 / 24
A3354705	25.4
9109401.3	36.5 / 39.6

Fuse Information

IS CHOOSING THE RIGHT FUSE IMPORTANT? DOES IT REALLY MATTER WHAT FUSE I USE?

Choosing the right fuse for your application is vital. A fuse is a protective device so if it's not selected with care, the level of protection that your circuit will experience may be compromised. When your machine/circuit was designed, the designer carefully considered the level of protection that was required, so getting it wrong may have serious consequences. Also, please refer to 'What is a Utilisation Category?' in this section.

WHAT ARE FUSES USED FOR?

Fuses serve two main purposes:

1. To protect components and equipment from costly damage caused by overcurrents.
2. To isolate sub-systems from the main system once a fault has occurred.

Also, please refer to 'Can I replace a fuse with a circuit breaker?' in this section.

WHAT ARE OVERCURRENTS?

Overcurrents exist when the normal load for a circuit is exceeded and they can be either (1) overloads, or (2) short circuits. An overload is any current flowing within the normal circuit path that is higher than the circuit normal full load current. A short circuit is an overcurrent which greatly exceeds the normal full load current of the circuit. Also, as the name infers, a short circuit leaves the normal current carrying path of the circuit and takes a "short cut" around the load and back to the power source. Short circuits are also referred to as 'fault currents'. Components and equipment can be seriously damaged by both types of overcurrents. However if they are not immediately cut-off or limited, short circuits can have catastrophic consequences.

HOW DO I IDENTIFY & REPLACE A BLOWN FUSE?

In most cases, people contact Fuseco when they need to replace an existing fuse that has blown. In such cases, it is paramount that either the identical fuse or an exact equivalent is provided. Care must be taken to make sure that the fuse provided is of the same utilisation category and has the same electrical performance of the original. If you need assistance with this, we welcome you to contact us and we would be very happy to assist you. Also, we provide many types of cross-reference charts in this catalogue, on our website or in a wall chart format. These tools can help you identify equivalent fuse types.

HOW DO I SELECT A FUSE FOR A NEW APPLICATION?

During normal conditions, the fuse must carry the load current of the circuit without blowing and opening the circuit. However, when an overcurrent occurs, the fuse must interrupt the overcurrent and withstand the voltage across the fuse after arcing. It is important that designers take account of temporary conditions such as surges & spikes during fuse selection. To properly select a fuse the following items must be considered:

- Available short circuit current
- Voltage rating (AC or DC)
- Full load current
- Characteristics of components to be protected
- Any in-rush characteristics of the circuit (eg. Motor start-up)
- The available space
- The ambient conditions
- Any standards requirements
- Suitability to the proposed fuse holder (eg. Power loss)

IS THE VOLTAGE RATING IMPORTANT?

Yes, very important! The voltage rating of the selected fuse must be greater than or equal to the circuit voltage. Since fuses have such low resistance, the voltage rating becomes critical only when the fuse is trying to open. The fuse must be able to open quickly, extinguish the arc after the fuse element has melted and prevent the system open circuit voltage from re-striking across the open fuse element.

CAN I USE AN AC RATED FUSE IN A DC APPLICATION?

Direct currents are very difficult to stop or interrupt when compared to alternating currents. Alternating current sources reverse the flow of current many times a second (in some locations 100 times a second on 50 Hz systems). Each time the current reverses, it goes to zero in magnitude. A zero current is very easy for a melting fuse to stop or interrupt—it is already stopped, and there is no force trying to sustain an arc across the fuse element.

DC currents, as the name implies, are currents that travel in one direction only. They do not reverse. Fuses bear the entire burden (with no help from the current) of acting to stop these currents. The internal elements of a fuse must react to an over-current condition (usually by melting) and as they react, they must do so with enough capability to interrupt the current from flowing while extinguishing any arc that might form. DC fuses are relatively sophisticated devices that have many different internal elements that must work together.

There are fuses with equal AC and DC voltage ratings but in most cases, the DC voltage rating is significantly less than the AC voltage rating. If a fuse only has an AC voltage rating, it most probably was not designed for DC applications and hence has never been tested within a DC environment.

If you would like to ask if a specific AC rated fuse can be used in a DC environment, please call Fuseco.

IS THE CURRENT RATING IMPORTANT?

Yes, very important! Each fuse is marked with a nominal current rating. The current rating of the fuse must be higher than the circuit's normal operating current. As to how much greater, it depends on a number of factors, including what type of opening characteristic you desire. Contact Fuseco for more specific advice.

WHAT DOES HRC MEAN?

HRC means high rupturing capacity, also known as high breaking capacity (HBC) or interrupting capacity. Usually ceramic and measured in kA.

IS THE BREAKING CAPACITY IMPORTANT?

Yes, very important! A fuse must be able to open the circuit during a short circuit without losing physical integrity. In other words, it should be able to exist under a maximum fault level load without physically cracking or disintegrating. The breaking capacity of a fuse is the maximum available current, at the rated voltage that the device can safely open without physically rupturing. The breaking capacity of the fuse must be greater than the potential fault (short circuit) current of the circuit.

The Breaking Capacity is also known as the 'Interrupting Rating'. It is expressed in amps (A) but breaking capacity values are often large numbers. For example, a breaking capacity of 120,000A is usually expressed as 120kA.

SHOULD I CARE ABOUT STANDARDS AND APPROVALS?

Yes, it's an important consideration. The IEC standards are followed by many European and Asian countries while the UL standards are followed by North America. Both of these standards have different ways of defining and measuring their criteria so UL and IEC rated fuses are not interchangeable. If you are replacing fuses, it is a good idea to replace with a fuse that complies to the same standard as the original fuse. If you are sourcing fuses to be used in exported equipment, make sure that the fuses comply with the destination country's required standards.

WHAT IS A UTILISATION CATEGORY?

All fuses are designed to open a circuit to protect other valuable components from overcurrents. However, they are not all designed to do it in the same way! There are many different types of fuse performance options and selecting the correct performance for your application is vital. For this purpose, the IEC created 'Utilisation Categories' (please refer to the inside cover of the Fuse separator in this catalogue).

For example, fuses that are designed to protect sensitive semiconductor devices are designed to open very quickly and let through a minimum amount of energy during an overcurrent yet motor protection fuses are designed to withstand large in-rush currents in multiple start-up situations. Some fuses only protect against short circuits when others also protect against overloads. There are many differences. Choosing the wrong fuse could potentially cause serious damage by under-protecting or could cause excessive down time due to nuisance-blowing. Fuseco can assist you to make the right choice.

WHAT ARE THE MAIN FUSE GROUPS?

There are literally millions of different fuses that exist around the world, however most of them belong to one of the following groups:

- 1. Sub-miniature and SMD fuses
- 2. Miniature fuses
- 3. Cartridge fuses
- 4. British Standard fuses
- 5. DIN NH Blade fuses
- 6. Automotive & DC fuses
- 7. European Standard & Bottle Fuses
- 8. American Standard fuses
- 9. Medium Voltage fuses

WHAT IS THE I^2T OF A FUSE?

The I^2t value of a fuse is a measure of the energy which is required to open the fuse element and to interrupt the current. It is determined by factors such as the design of the fuse element, the type of filler, etc. The I^2t value is also a direct measure for the let-through energy which is exposed to the item being protected by the fuse in case of an overcurrent situation. It is a function of current squared and time, hence it is expressed in A^2s (amps x amps x seconds).

WHAT IS A SEMICONDUCTOR FUSE?

Semiconductor fuses are fuses that have been specifically designed to protect semiconductor devices. They are often also referred to as solid state fuses, rectifier fuses or ultra-rapid fuses. Semiconductor devices are extremely sensitive to current fluctuations and require special protection. To perform this function, semiconductor fuses are able to open the circuit (blow) significantly quicker than other fuse types, and it is extremely important that they are replaced by direct equivalents when required. Semiconductor fuses belong to the utilisation categories aR, gR and gS.

HOW DO I CHOOSE THE RIGHT SEMICONDUCTOR FUSE?

Semiconductor fuses are not selected like other fuse types. The main selection criteria for a semiconductor fuse is its I^2t value…. even more important than its current rating! This is because semiconductor devices are extremely sensitive to current fluctuations and the maximum amount of let-through energy that they are exposed to during an overcurrent needs to be accurately controlled. This is super-important when selecting fuse protection for semiconductor devices.

If you are replacing an existing fuse, make sure that the new selected fuse has an I^2t value that within ±10% of the original fuse's I^2t value. In this case, I^2t values need to be compared at the same system voltage.

If you are selecting a semiconductor fuse for a new application, the I^2t value of the selected fuse must be lower (or quicker) than the lowest I^2t value of any of the components being protected. This ensures that the fuse opens before allowing any damaging let-through current to reach the components. In addition, refer to the question 'Can I enclose a semiconductor fuse in a fuse holder?' in this section.

CAN I ENCLOSE A SEMICONDUCTOR FUSE IN A FUSE HOLDER?

Semiconductor fuses run hotter than most fuses. In order to achieve a very accurate melting temperature, these fuses have been engineered with a high proportion of pure silver in their element and their body filling is high quality silica, which helps to draw heat away from the fuse element. Due to this fact, it is generally accepted that they should not be enclosed so as to ensure sufficient cooling of the fuses so they can operate as specified. Fuse cooling is very challenging if the fuse holder doesn't allow sufficient airflow around the fuse.

The 'power loss' value of a fuse is a measure of the heat emanating from the fuse under full load. It is used to determine how quickly the fuse dissipates its heat. This is also known as the 'heat loss', 'watts loss' or 'heat dissipation value'. Power loss is measured in Watts.

If any fuse is to be used in a fully enclosed holder, then the power loss rating of the fuse holder used must be greater than that of the fuse to ensure that there is sufficient dissipation of the heat around the fuse. In other words, the fuse holder's ability to tolerate heat must be higher than the heat the fuse produces. If this is not followed, the fuse holder may warp, melt or explode. Due to the fact that semiconductor fuses run much hotter than type gG or type aM fuses, extra care must be taken when choosing fuse holders for them.

CAN I REPLACE A SEMICONDUCTOR FUSE WITH A STANDARD GG FUSE?

Please don't! If you do, then in the event of an overcurrent, you run the risk of experiencing critical damage to the semiconductor devices in the circuit. In plain words, your expensive components will blow before your fuse does.

CAN I REPLACE A FUSE WITH A CIRCUIT BREAKER?

Circuit breakers have the advantage of being resettable and operationally cheaper and they have certainly taken over the downstream protective role where the potential fault currents are lower. So if you have a fuse in a downstream role, then in some cases, YES you can replace it with a circuit breaker.

However, due to their unique qualities, fuses are still required upstream in the critical role. They are, in essence, the 'gatekeepers' of the protection system. They are actually the most important protective device in the system. Fuses have three unique characteristics:

1. They are safe. Modern fuses have extremely high breaking capacities – can withstand very high fault currents without rupturing.
2. Properly applied, fuses prevent 'blackouts'. Only the fuse nearest the fault opens without upstream fuses (feeders or mains) being affected. Fuses can provide selective co-ordination.
3. Fuses provide optimum component protection by keeping fault currents to a low value… They are said to be current limiting.

So if you have a fuse in a critical upstream role. Then NO you cannot replace it with a circuit breaker.

We welcome you to contact the team at Fuseco to assist you with any questions or projects. Also, please explore our website www.fuseco.com.au as you will find plenty of useful information, tools and cross-reference charts.

Utilisation Categories

In the past, industrial fuses were considered to have 'operation speeds' such as 'fast acting' or 'slow acting'. In recent years, these descriptions have been replaced with a new way of communicating the intended function of a fuse – the 'Utilisation Categories' (created by the IEC). Most fuses are marked with symbols denoting their particular application or characteristic. The symbols consist of two or three letters.

The first, lower-case letter indicates the breaking range of the fuse.

- "g" stands for **full-range breaking capacity** fuse-link, meaning that the fuse is capable of breaking all overcurrents from its minimum melting current up to its breaking capacity. These fuses can **protect from overloads and short circuits**. Full-range breaking capacity fuses can be used as sole protective devices.
- "a" stands for **partial-range breaking capacity** fuse link, meaning that the fuse is capable of only breaking high currents of a multiple of its rated current. Partial-range breaking capacity fuses are designed for **short-circuit protection only**, and are therefore used in combination with other devices providing protection against overcurrents. They are also frequently used for back-up protection of other switching devices having a lower breaking capacity (eg. contactors or circuit breakers).

The second, upper-case letter indicates the characteristic. These are related to the intended application. For example, 'G' relates to general applications (cable & line protection) and 'M' relates to motor circuits. Sometimes, this part can be expressed with two letters such as 'PV' (Photovoltaic protection) or 'Tr' (Transformer protection).

CURRENT UTILISATION CATEGORIES

gG Full range breaking capacity fuse for general application, mainly used for cable and line protection. Formerly known as gl, gll, gL, gT & gF.

aM Partial range breaking capacity fuse for the short circuit protection of motor circuits.

gR Full range breaking capacity fuse for the protection of semiconductor devices (quicker than gS).

aR Partial range breaking capacity fuse for the short circuit protection of semiconductor devices.

gPV Full range breaking capacity fuse for the protection of photovoltaic systems. Also known as PV.

gS Full range breaking capacity fuse for the protection of semiconductor devices for increased line utilisation. Combines gR and gG performance. Semiconductor protection against short circuits via the gR characteristic combined with cable protection against overload via the gG characteristic.Formerly known as gRL & gGR.

gB Full range breaking capacity fuse for mining applications. Formerly known as gTF.

gTr Full range breaking capacity fuse for transformer protection, rated in transformer apparent power (kVA) instead of rated current (A).

gM Full range breaking capacity fuse for motor circuit protection, dual rated (widely used in the UK, Australia & South Africa).

gN North American general application fuse, mainly for cable and line protection.

gD North American general application time-delay fuse, mainly for motor circuit protection.

IDENTIFICATION OF MINIATURE FUSES

As there is no global standard requirement, most miniature electronic fuses do not have any identifiable markings that communicate their design function. However, most of the European brands have the following markings:

MARKINGS	FUNCTION
FF	Very Fast Acting (Flink Flink)
F	Fast Acting (Flink)
M	Medium Acting (Mittelträge)
T	Slow Acting (Träge)
TT	Very Slow Acting (Träge Träge)

FUSES

PROTECTION RELAYS

POWER FACTOR CORRECTION

POWER QUALITY

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TEST EQUIPMENT

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PROTECTION RELAYS

When Safety Matters

Protection Relays

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Arc Flash Relay Comparison Guide

Reliable Operation with Built In Redundancies

When you are entrusting a safety device to protect equipment from catastrophic damage, it is important to know that it will operate as expected. Littelfuse Arc Flash Relays do this by having built in redundancies and health monitors, making maintenance and installation tasks faster, more efficient and helping to minimise downtime.

	AF0100	AF0500	PGR-8800
Redundant Internal Trip Path • Two internal trip paths for added reliability—if the microprocessor trip path fails, the backup analog trip path will seamlessly take over, sending an alarm notification to operators • Backup analog trip path initializes very quickly upon power up, ensuring protection is enabled while energizing the system when hazard risk is higher	✓	✓	✓
Health Monitoring • Continuously monitors connection to trip coil to ensure path is intact LED indication of sensors' "Ready" or "Tripped" status on sensor and relay • Sensors are durable enough to withstand a detected arc flash event	✓	✓	✓
Reliable Light Detection • Two types of light sensors (point and fibre optic) for different applications • Adjustable light level and wide angle detection add flexibility • Durable and flexible sensor design eliminates breakage and re work	✓	✓	✓
High Speed (<1 ms) Trip • Rapidly initiate the removal of power to reduce the incident energy of the arc flash		✓	✓
Upstream Tripping • Ability to trip upstream device if the local breaker fails to clear the fault		✓	✓
Data Logging • Quickly assess the factors that led to a trip in order to get back online quickly		✓	✓
Optional Current Detection for Fault Verification • Avoid nuisance tripping with current supervised arc flash trips • Phase Current Transformers for overcurrent detection • Two user defined definite time overcurrent protection levels and times			✓
Tie Breaker Tripping • Ability to trip both incoming feeder and tie breaker when arc is detected in one section of a switchboard • Affected part of the switchboard is isolated from the non affected part		✓	
Zone Tripping • Ability to trip 2 separate zones with 1 relay • Sensor zone assignment through simple PC configuration and/or digital inputs and outputs		✓	

AF0100 Series

Arc Flash Relay

Description

The AF0100 Series Arc Flash Relay is a cost effective solution that reduces arc fault damage by detecting the light from an arc flash and rapidly tripping the feeder breaker. Two remote light sensors can be connected to one relay and multiple AF0100 and/or AF0500 relays can be connected to monitor additional sensors, providing complete coverage for a wide range of applications. The compact, DIN rail or surface mountable body makes this an ideal solution for equipment manufacturers.

Two isolated Form C contacts are provided for applications with multiple devices that must be tripped. This is especially useful for generator applications where the generator and breaker need to be tripped in case of an arc flash.

The AF0100 accepts PGA-LS10 point sensors and PGA-LS20/ PGA-LS30 fibre optic sensors in any combination. Sensor health is continuously monitored to ensure failsafe operation. A solid state redundant trip circuit provides an internal failsafe mechanism and fast arc flash response during power up.

Front panel and sensor LEDs indicate sensor health and fault location.

Features and Benefits

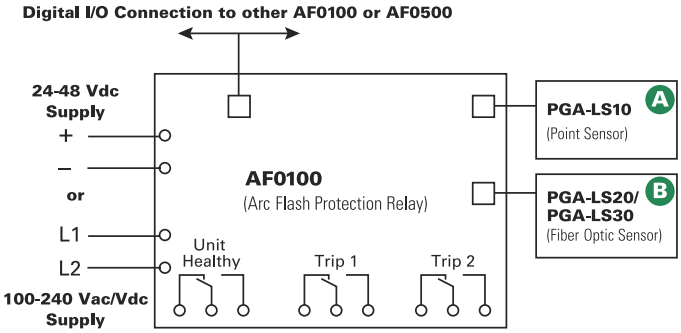
FEATURES	BENEFITS
Compact	Fits into a wide range of arc flash applications
Two optical sensor types	Point sensors or fibre optic sensors can be used in any combination for coverage flexibility
Dual sensor inputs	One relay can monitor two arc flash sensors
Discrete wire networking	Multiple AF0100 or AF0500 units can be interconnected to form a system
Fail safe system	Continuous monitoring of optical sensors and inputs ensures protection
USB Interface	Configuration software is easy to use with no drivers or software installation
Unit health	Ensures continuous protection with self diagnostic and remote unit healthy indication
LED Indication	Trip and sensor status indication both on relay and sensors

ORDER NO.	DESCRIPTION
AF0100-00	Arc Flash Relay, Universal Supply

ACCESSORIES	REQUIREMENTS
PGA-LS10	Required*
PGA-LS20, PGA-LS30	Required*

*At least one sensor is required. However, the exact number of sensors for proper coverage depends on the application.

Simplified Circuit Diagram



Specifications

Input Voltage	
AF0100-00	100–240 VAC/VDC, 24–48 VDC
Dimensions	**H** 90mm **W** 128mm **D** 60mm
Trip, Error Relays	Form C, 250 VAC/30 VDC, 6 A resistive
Trip Time	5ms (typical)
Sensitivity	10–25 klux programmable
Mounting	Surface, DIN rail
Operating Temperature	–40°C to +70°C
Certifications	UL Listed (UL 508), CE, RCM, FCC
Warranty	5 years

Accessories

PGA-LS10 Point Sensor
Line of sight light sensor detects an arc as small as 3kA within a 2 metre half sphere. Sensor health and trip indication.

PGA-LS20/PGA-LS30
Fibre Optic Sensor 360° light sensor for tricky installations with many shadows or to run along bus bars. Sensor health and trip indication.

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AF0500 Series

Arc Flash Relay

Description

The AF0500 is a microprocessor based Arc Flash Relay that limits arc fault damage by detecting the light from an arc flash and rapidly tripping the feeder breaker. The unit is well suited for switchgear, transformer and power converter applications.

Sensors, inputs and connections are health monitored to ensure fail safe operation. A secondary solid state trip circuit provides a redundant trip path. A USB port is used for configuration and access to event logs.

AF0500 includes an Ethernet interface and supports Modbus® TCP communication. Zone tripping, upstream breaker tripping and tie breaker tripping applications can be easily configured.

A number of control inputs allows interconnection of multiple AF0500 units to form a system.

Optical Sensors

The AF0500 accepts both PGA-LS10 point sensors and PGA-LS20/ PGA-LS30 fibre optical sensors. Thus any combination of fibre or point sensors is supported.

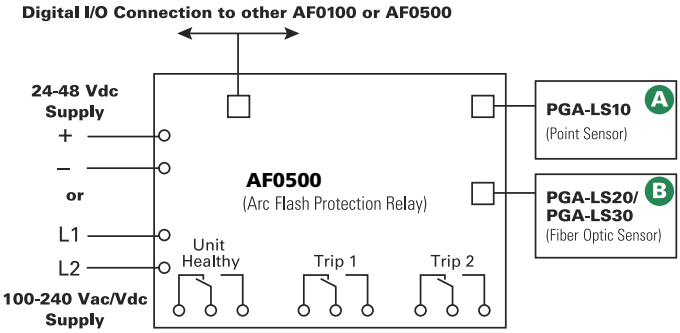
For fast fault location, front panel and sensor LEDs indicate sensor health and which sensor detected an arc fault.

Sensor Placement

The AF0500 Arc Flash Relay and sensors are easily installed in retrofit projects and new switchgear with little or no reconfiguration. Simple applications work straight out of the box with no need of PC configuration. More complex systems with multiple power sources are configured using the relay's built in USB interface software.

Generally, it is recommended to mount 1 or 2 sensors per cubicle to cover all horizontal and vertical bus bars, breaker compartments, drawers, and anywhere that there is a risk for an arc fault. Threading a fibre optic sensor through the cabinets and in areas where point sensor coverage is uncertain results in complete coverage and an added level of redundancy. Even if policy is to only work on de energised systems, all maintenance areas should be monitored to prevent potential damage and additional cost.

Simplified Circuit Diagram

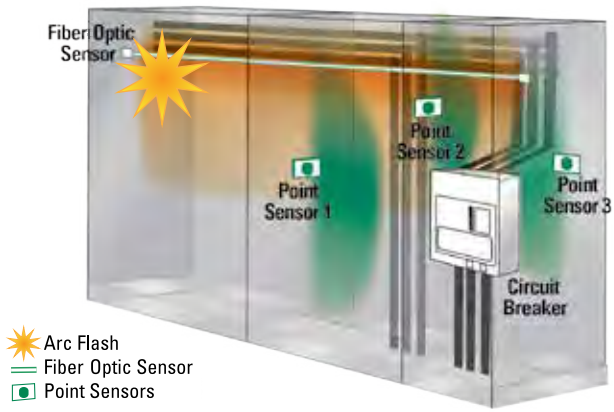


Ordering Information

ORDER NUMBER	DESCRIPTION
AF0500-00	Arc Flash Relay, Universal Supply

ACCESSORIES	REQUIREMENTS
PGA-LS10	Required*
PGA-LS20, PGA-LS30	Required*
PGA-1100	Optional

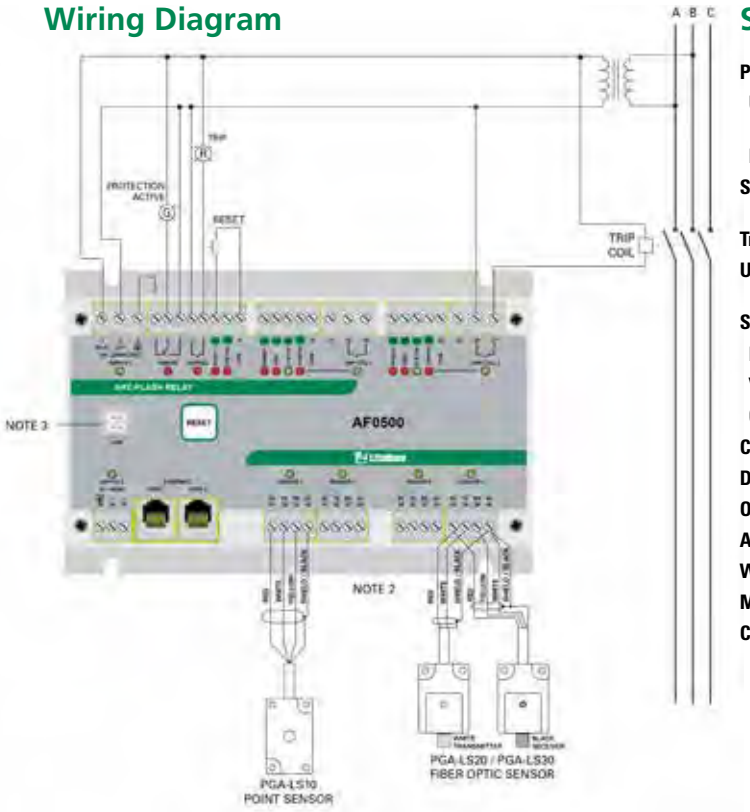
*At least one sensor is required. However, the exact number of sensors for proper coverage depends on the application.



Features & Benefits

FEATURES	BENEFITS
4 arc sensor inputs	Supports both point and fibre sensors
Arc flash trip time <1ms	Limits arc flash damage and risk of injury
2 IGBT high speed trip outputs	Supports applications such as upstream breaker tripping or tie breaker tripping
Universal Power Supply	100–240 VAC, 24–48 VDC, or 110–250 VDC supply
Fail safe system	Continuous monitoring of optical sensors and inputs ensures protection
LED indication (on unit and each sensor)	Trip and sensor status indicated both on relay and sensors
Discrete wire networking	Multiple AF0500 units can be interconnected to form a system
USB interface	Data logging and configuration software uses a USB interface with no drivers or software installation
Data logging	On board event recorder for system diagnostics (2048 log lines)
Ethernet interface	Modbus® TCP communication

Wiring Diagram



Specifications

Power Supply	
Universal	100 to 240 VAC (+10%, –15%) 50/60 Hz, 20 VA, 110 to 250 VDC (+10%, –20%) 8 W
Low Voltage	24 to 48 VDC (+10%, –20%), 4 W
Sensor Inputs	4 light sensor inputs for PGA-LS10, PGA-LS20 and PGA-LS30 sensors
Trip Outputs	2 IGBT switches
UL Rating	120/240 VAC, 1800 VA, 0.75 A maximum continuous, 125/250 VDC, 138 VA, 0.75 A maximum continuous
Supplemental Rating	
Make/Carry	30A for 0.2s
Voltage Rating	24 to 300 VAC, 24 to 300 VDC
Current Rating	20A for 2s, 10A for 5s
Communication	Ethernet, 2 ports with internal Ethernet switch, Modbus® TCP
Dimensions	**H** 130mm **W** 200mm **D** 54mm
Operating Temp.	–40°C to +70°C
Approvals	UL Listed (UL508), CE, RCM, FCC, CSA
Warranty	5 years
Mounting	Surface, DIN (with optional D0050 adapter clips)
Conformal Coating	Available upon request

Accessories

PGA-LS10 Point Sensor
Line of sight light sensor detects an arc as small as 3kA within a 2 metre half sphere. Includes sensor health and trip indication

PGA-LS20/PGA-LS30 Fibre Optic Sensor
360° light sensor to run along bus bars. Sensor health and trip indication.

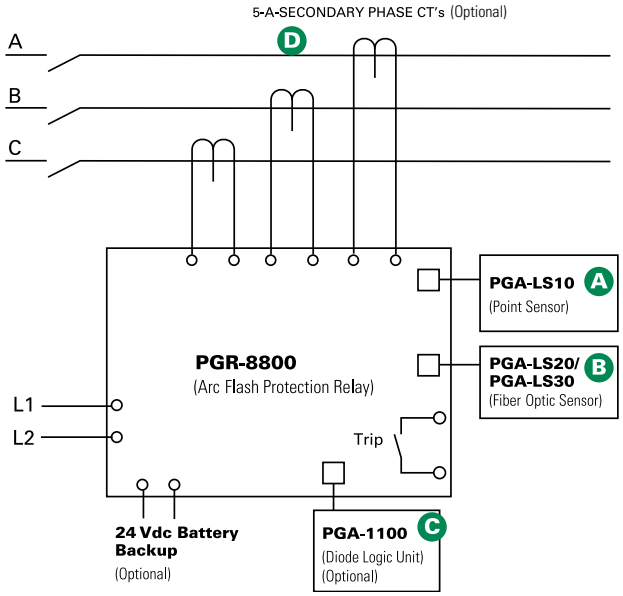
PGA-1100 Diode Logic Unit
This module allows multiple Arc Flash Relays to trip a common breaker, for example a tie breaker.

FUSECO

PGR-8800 Series

Arc Flash Relay

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	DESCRIPTION
PGR-8800-00	Arc Flash Relay, Universal Supply

ACCESSORIES	REQUIREMENTS
PGA-LS10	Required*
PGA-LS20/PGA-LS30	Required*
PGA-1100	Optional
Current Transformer	Optional

*At least one sensor is required. However, the exact number of sensors for proper coverage depends on the application.

Description

The PGR-8800 is a microprocessor based relay that limits arc fault damage by detecting the light from an arc flash and rapidly tripping. Phase current transformer inputs are provided for current constrained arc flash protection and, when so equipped, a programmable definite time overcurrent function can be enabled. An optical sensor on the PGR-8800 and adjustable trip level reduce the chance of nuisance tripping by setting a threshold for ambient light. Sensors, inputs, and connections are monitored to ensure fail safe operation. A secondary solid state trip circuit provides a redundant trip path. A USB port is used for configuration and access to event logs and graphs.

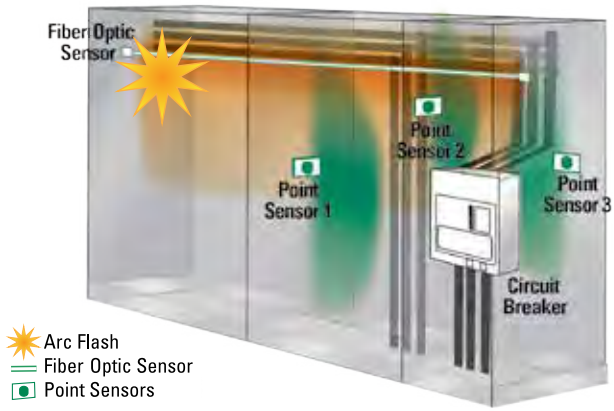
Optical Sensors

The PGR-8800 accepts both PGA-LS10 and PGA-LS20/PGA-LS30 optical sensors, designed to collect light over a wide angle and with high sensitivity. For fast fault location, front panel and sensor LED's indicate sensor health and which sensor detected an arc fault.

Sensor Placement

The PGR-8800 Arc Flash Relay and sensors are easily installed in retrofit projects and new switchgear with little or no reconfiguration. Even elaborate systems with multiple power sources take minutes to configure using the relay's built in USB interface software.

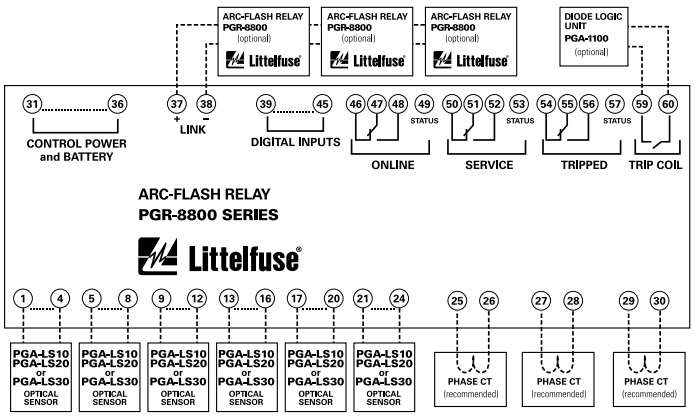
Generally, it is recommended to mount 1 or 2 sensors per cubicle to cover all horizontal and vertical bus bars, breaker compartments, drawers, and anywhere that there is potential for an arc fault. Threading a fibre optic sensor through the cabinets and in areas where point sensor coverage is uncertain results in complete coverage and an added level of redundancy. Even if policy is to only work on de energised systems, all maintenance areas should be monitored to prevent potential damage and additional cost. At least one sensor should have visibility of an arc fault if a person blocks the other sensor(s).



Features & Benefits

FEATURES	BENEFITS
Arc flash trip time	<1ms Limits arc flash damage and risk of injury
Multiple sensors (up to 24)	Single module can monitor 6 sensors. Up to 4 PGR-8800 units can be linked into one system
Fail safe system	Continuous monitoring of optical sensors and inputs ensures protection
Redundant trip circuit	Solid state backup arc detection circuit adds a second layer of safety
Adjustable light sensitivity	Allows for operation in bright environments and maximum sensitivity in dark environments
LED indication (on unit and each sensor)	18 LEDs provide at a glance status for module and I/O state
Current detection	Phase CT inputs provide overcurrent protection and prevent nuisance trips
Optical detection	Point and fibre optic sensors provide wide detection area with sensor health trip indication
Digital inputs (6)	Two each: remote trip, inhibit, and reset inputs
Service mode	Allows for system test without tripping
Trip coil contact	Solid state 24–300 VDC/24–300 VAC IGBT
Indication contacts	Form C and status outputs
USB interface	Data logging and configuration software uses a USB interface with no drivers or software installation
Built in sensor	Can be used in single sensor systems, as a seventh sensor, and for calibration
Universal power supply/ Battery backup	100–240 VAC, 14–48 VDC, or 110–250 VDC supply accepted. Ability to charge and run off an external, user supplied 24 VDC battery.
Data logging	On board event recorder helps with system diagnostics
Modbus	Remotely view measured values, event records & reset trips
Upstream Tripping	Ability to trip upstream device if the local breaker fails to clear the fault

Wiring Diagram



Specifications

IEEE Device Numbers	Overcurrent (50), Arc Flash (AFD)
Input Voltage	100–240 VAC, 14–48 VDC, and 110–250 VDC
Dimensions	**H** 130mm **W** 200mm **D** 54mm
Optical Trip Settings	9–25 klux, 800 µs-20 s
Current Trip Setting (A)	Programmable
Indication Contact Mode	Fail safe
Trip Coil Voltage(1)	24–300 VDC, 24–300 VAC
Trip Coil Contact Mode	Selectable fail safe or non fail safe
Redundant Trip Circuit	Standard feature
Input Monitoring	Standard feature
Trip, Reset, Service Buttons	Standard feature
Expandable System	Link up to 4 PGR-8800 units
Approvals	UL Listed (UL508), CE, RCM, FCC, CSA
Warranty	5 years
Mounting	DIN (with D0050 adapter clips), Surface
Conformal Coating	Available upon request

Accessories

PGA-LS10 Point Sensor
Line of sight light sensor detects an arc as small as 3kA within a 2 metre half sphere. Sensor health and trip indication.

PGA-LS20/PGALS30
Fibre Optic Sensor 360° light sensor for tricky installations with many shadows or to run along bus bars. Sensor health and trip indication.

PGA-1100 Diode Logic Unit
This module allows multiple PGR-8800 relays to trip the same breaker, for example an upstream or a tie breaker.
Dimensions: **H** 80mm **W** 20mm **D** 70mm

Current Transformers
Eliminate nuisance arc flash trips and use for overcurrent protection.

FUSECO

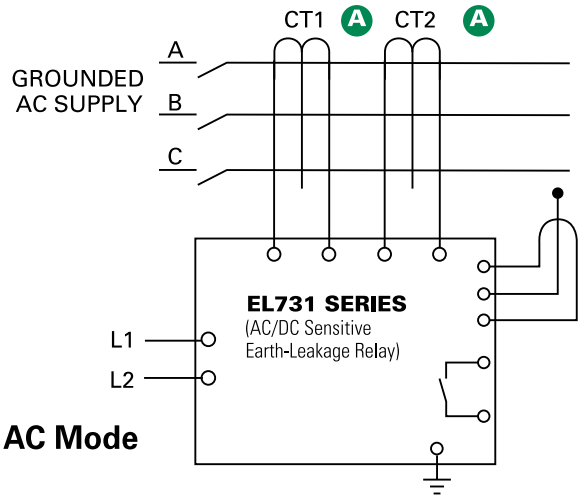
EL731 Series

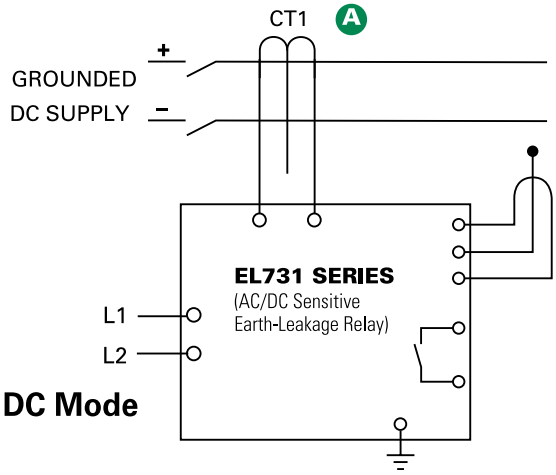
AC/DC Sensitive Earth Leakage Relay

Description

The EL731 is a microprocessor based AC/DC Sensitive Earth Leakage Relay that offers complete coverage for all frequencies from 0 to 6,000 Hz. Two CT's are required for the entire frequency range, or one CT can be used for only low or high frequency detection. An RTD/PTC sensor input allows over temperature protection for a motor or drive. The EL731 offers metering, password protected alarm and trip settings and optional network communications. It is primarily used to add low level ground fault protection to variable speed drives, and to dc circuits. The EL731 relay is specifically designed to be compliant to AS/NZS 2081.6:2011 (see ordering information).

Simplified Circuit Diagram





Ordering Information

ORDER NUMBER		POWER SUPPLY	COMMS		COMPLIANCE	
EL731	–	**X**	**X**	–	**X**	**0**
EL731		0 = 120/240 VAC/VDC 1 = 48 VDC & 24 VAC 2 = 24 VDC	0 = None 1 = DeviceNet ™ 2 = Profibus ® 3 = EtherNet/IP ™ 4 = Modbus ® TCP		1 = AS/NZS 2081:2011 Compliance (fail safe output contacts) 0 = AS/NZS 2081:2002 compliance (selectable fail safe output contacts)	

ACCESSORIES	REQUIREMENTS
EFCT Series CT	One Required
AC700-CUA Series Com. Unit	Optional
AC700-SMK Surface Mount Kit	Optional
AC700-CVR-00 Watertight Cover (IP66) for Panel Mount Applications	Optional
PGA-0520 Analog Meter	Optional

Accessories

EFCT Series Earth Fault Current Transformer
Required zero sequence current transformer specifically designed for low level detection.

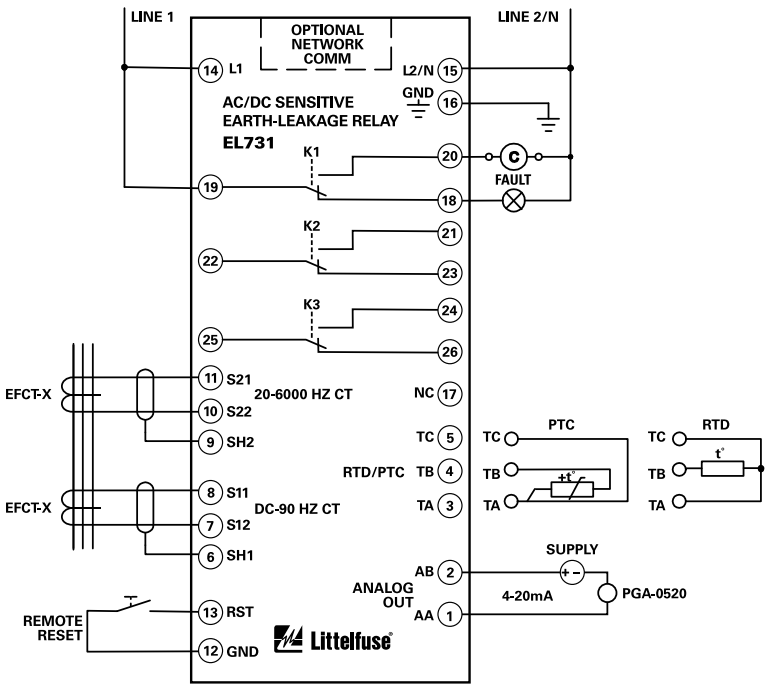
AC700-CUA Series
Communication Adapter Optional network interface and firmwareupgrade communications adapters field install in EL731.

AC700-SMK DIN rail & Surface mount Adapter
EL731 plugs into adapter for back plane mounting.

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (30–5,000 mA)	Adjustable trip setting provides a wide range of low level protection and system coordination
Frequency range (0–90 Hz, 20–6,000 Hz)	Operate in either AC or DC mode or both. Use single or combined ranges. Separate metering
32 char OLED display	Earth leakage metering, setup and programming
Local LED indication	Visual Trip, Alarm, CT connection indication
CT Loop monitoring	Alarms when CT is not connected
Analog output (4–20 mA)	Connect to DCS. Allows connection to an optional meter (PGA-0520) or control system
Adjustable time delay	Adjustable trip delay for quick protection and system coordination
Alarm and trip settings	Detect a deteriorating condition before damage occurs
Temperature sensor input	Drive or motor temperature protection
Output contacts	3 programmable: Operate 2 alarm and 1 trip circuit
Network communication	Optional connection to plant network
Harmonic filtering	Eliminates nuisance tripping due to harmonic noise
Microprocessor based	No required calibration saves maintenance cost
Universal power supply	Provides flexibility for numerous applications

Wiring Diagram



Specifications

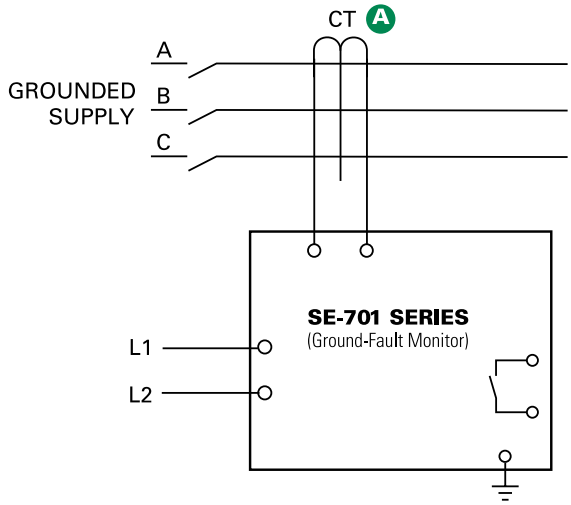
IEEE Device Numbers	AC ground fault (50G/N, 51G/N), DC ground fault (79G), PTC overtemperature (49), RTD temperature (38, 49)
Supply Voltage	120/240 VAC/VDC, 24 VDC, 48 VDC/24 VAC
Trip Level Settings	30–5,000mA AC and DC
Alarm Level Settings	30–5,000mA AC and DC
Trip Delay	0.05–2s
Output Contacts	3 Form C (programmable)
Contact Operating Mode	Fail safe & non fail safe
Reset	Front panel and remote
Freq. Response, CT1	0–90 Hz
Freq. Response, CT2	20–6,000, 190–6,000, 20–90, 20–3,000 Hz; selectable
Current Transformer	EFCT-x series
CT Detection	Open & short detection
Terminals	Plug in, wire clamping, 24 to 12 AWG (0.2–2.5 mm^2)
Communications	EtherNet/IP™, DeviceNet™, Profibus®, Modbus® TCP (optional)
Analog Output	4–20mA (selectable 0–5 A or 0–100% trip level setting)
Conformal Coating	Standard feature
Dimensions	**H** 48mm **W** 96mm **D** 129mm
Approvals	UL Listed (E340889), CSA, RCM (Australia), CE
Warranty	5 years
Mounting	Panel; Surface and DIN (with optional AC700-SMK)

FUSECO

SE-701 Series

Earth Leakage Relay

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	POWER SUPPLY
SE-701-OU	120/240 VAC/VDC
SE-701-OD	12/24 VDC
SE-701-OT	48 VDC
SE-701-O3	24 VAC

ACCESSORIES	REQUIREMENT
Current Transformer	Required
PGA-0500	Optional
PMA-60	Optional
SE-EFVC Voltage Clamp	Optional

Description

The SE-701 is a microprocessor based earth leakage relay for resistance and solidly grounded systems. In addition to common systems, it is uniquely suited for use on systems with significant harmonic content. The SE-701 can provide main plant protection, feeder level protection, or individual load protection. Proper current transformer selection provides the desired pickup range. The output contacts can be connected for use in protective tripping circuits or in alarm indication circuits. The analog output can be used with a PLC or a meter.

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (1–99%)	Trip setting based on input CT primary, allows use with any CT. Minimum 50 mA with EFCT Series.
Adjustable time delay (50ms–2.5s)	Adjustable trip delay allows quick protection and system coordination
Output contacts	Form A and Form B ground fault output contacts for operation of separate annunciation and trip circuits
Analog output (0–5 V)	Allows for connecting an optional meter (PGA-0500) or a control system
CT Loop monitoring	Alarms when CT is not connected
Selectable DFT or peak detection filtering	Compatible with variable speed drives
Harmonic filtering	Eliminates nuisance tripping
Non volatile trip memory	Retains trip state while de energised to simplify troubleshooting
Microprocessor based	No calibration required, saves on maintenance cost
Universal power supply	Allows operation in application where one side of PT is faulted, provides flexibility for numerous applications

Accessories

Ground Fault Current Transformer
Required current transformer model depends on application. We offer a variety of sensitive CT's with 5A and 30A primaries.

PGA-0500 Analog % Current Meter
Optional panel mounted analog meter displays ground fault current as a percentage of the CT primary rating.

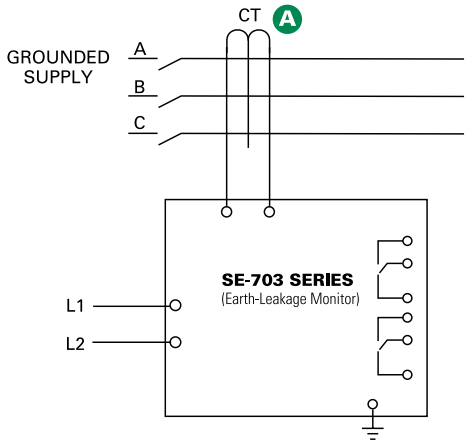
Specifications

IEEE Device Numbers	Ground fault (50G/N, 51G/N)
Input Voltage	See ordering information
Dimensions	**H** 75mm **W** 55mm **D** 115mm
Trip Level Settings	1–99% CT Primary Rating
Trip Time Settings	0.05–2.5 s
Contact Operating Mode	Selectable fail safe or non fail safe
Harmonic Filtering	Standard feature
Test Button	Standard feature
Reset Button	Standard feature
CT Loop Monitoring	Standard feature
Output Contacts	Isolated Form A and Form B
Approvals	CSA certified, UL Listed (E340889), CE (European Union), C Tick (Australian)
Analog Output	0–5V
Conformally coated	Consult factory
Warranty	5 years
Mounting	DIN, Surface (standard) Panel (with PMA-55 or PMA-60 adapter)

SE-703 Series

Earth Leakage Relay

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	–		POWER SUPPLY			
SE-703	**–**	**0**	X	**–**	**0**	X
SE-703	**–**	**0**	U = 120/240 VAC/VDC D = 12/24 VDC T = 48 VDC 3 = 24 VAC	**–**	**0**	0 = AS/NZS 2081:2011 Compliance (fail safe output contacts) 2 = AS/NZS 2081:2002 compliance (selectable fail safe output contacts)

ACCESSORIES	REQUIREMENT
EFCT Series	Required
PGA-0500	Optional
PMA-60	Optional
SE-EFVC Voltage Clamp	Optional

Description

The SE-703 is a microprocessor based earth leakage relay for resistance and solidly earthed systems. It offers sensitive earth fault detection as low as 25mA and can be used on systems with significant harmonic content. The SE-703 provides feeder level protection or individual load protection. The output contacts can be connected for use in protective tripping circuits or in alarm indication circuits. The analog output can be used with a PLC or a meter. The SE-703 is specifically designed to be AS/NZS 2081 compliant to either 2011 or 2002 (see ordering options).

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (25–500mA)	Adjustable trip setting provides a wide range of low level protection and system coordination
Adjustable time delay (INST–500ms)	Adjustable trip delay allows quick protection and system coordination
Output contacts	2 Form C ground fault output contacts for operation of separate annunciation and trip circuits
Analog output (0–5V)	Allows for connecting an optional meter (PGA-0500) or control system
CT Loop monitoring	Alarms when CT is not connected
Contact operating mode	Fail safe operating mode for undervoltage applications, optional non fail safe mode available
Harmonic filtering	Eliminates nuisance tripping
Non volatile trip memory	Retains trip state while de energised to simplify troubleshooting
Microprocessor based	No calibration required, saves maintenance cost
Universal power supply	Allows operation in application where one side of PT is faulted, provides flexibility for numerous applications
Global certifications	Compliant with US, Canadian, European, and Australian standards for applications in almost any country

Accessories

EFCT Series Ground Fault Current Transformer
Required zero sequence current transformer specifically designed for low level detection.

PGA-0500 Analog % Current Meter
Optional panel mounted analog meter displays ground fault current as a percentage of the set point or 5A.

PMA-60 Series – Mounting Adapter
Required when panel mounting for AS/NZS 2081:2011 compliance

Specifications

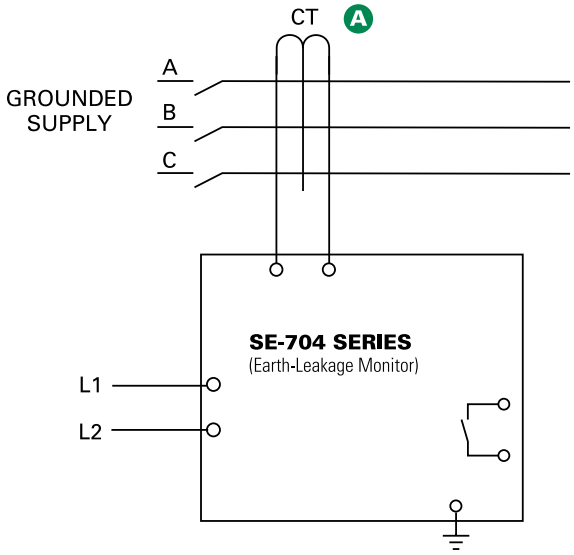
IEEE Device Numbers	Ground fault (50G/N, 51G/N)
Input Voltage	See ordering information
Dimensions	**H** 75mm **W** 55mm **D** 115mm
Trip Level Settings	25–500mA
Trip Time Settings	INST–500ms
Contact Operating Mode	Fail safe (x=0 models) or selectable (x=2 models)
Harmonic Filtering	Standard feature
Test Button	Standard feature
Reset Button	Standard feature
CT Loop Monitoring	Standard feature
Output Contacts	Two isolated Form C contacts
Approvals	CSA certified, UL Listed (E340889), CE (European Union), RCM (Australian)
Compliance	AS/NZS 2081:2011 (x=0 models) or AS/NZS 2081: 2002 (x=2 models)
Analog Output	0–5V
Conformally coated	Yes
Warranty	5 years
Mounting	DIN, Surface (standard) Panel (with PMA-55 or PMA-60 adapter)

FUSECO

SE-704 Series

Earth Leakage Relay

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	POWER SUPPLY
SE-704-0U	120/240 VAC/VDC
SE-704-0D	12/24 VDC
SE-704-0T	48 VDC
SE-704-03	24 VAC

ACCESSORIES	REQUIREMENT
SE-CS30 Series	Required
PGA-0500	Optional
PMA-60	Optional

Description

The SE-704 is a microprocessor based earth leakage relay for resistance and solidly grounded systems. It offers very sensitive ground fault detection as low as 10 mA and can be used on systems with significant harmonic content. The SE-704 provides feeder level protection or individual load protection. The output contacts can be connected for use in protective tripping circuits or in alarm indication circuits. The analog output can be used with a PLC or a meter..

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (10mA–5A)	Adjustable trip setting provides a wide range of low level protection and system coordination
Adjustable time delay (30ms–2.0s)	Adjustable trip delay allows quick protection and system coordination
Output contacts	Form A and Form B ground fault output contacts for operation of separate annunciation and trip circuits
Analog output (0–5V & 0–1mA)	Allows for connecting an optional meter (PGA-0500) or control system
CT Loop monitoring	Alarms when CT is not connected
Selectable contact operating mode	Selectable fail safe or non fail safe operating modes allows connection to shunt or undervoltage breaker coil
Harmonic filtering	Eliminates nuisance tripping
Non volatile trip memory	Retains trip state when de energised to simplify troubleshooting
Microprocessor based	No calibration required saves maintenance cost
Universal power supply	Allows operation in application where one side of PT is faulted, provides flexibility for numerous applications

Accessories

SE-CS30 Series Ground Fault Transformer
Required zero sequence current transformer specifically designed for low level detection. Flux conditioner is included to prevent saturation.

PGA-0500 Analog % Current Meter
Optional panel mounted analog meter displays ground fault current as a percentage of the set point or 5 A.

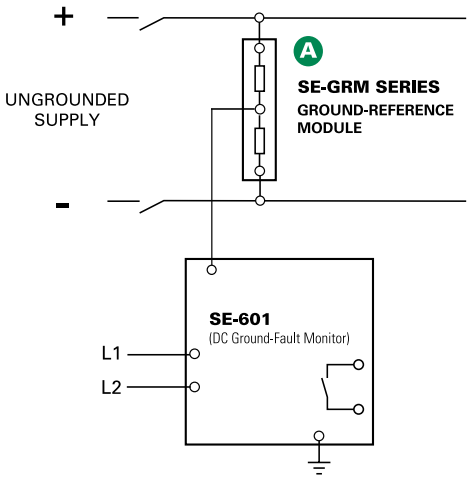
Specifications

IEEE Device Numbers	Ground fault (50G/N, 51G/N)
Input Voltage	See ordering information
Dimensions	**H** 75mm **W** 55mm **D** 115mm
Trip Level Settings	10mA–5.0A
Trip Time Settings	30–2000ms
Contact Operating Mode	Selectable fail safe or non fail safe
Harmonic Filtering	Standard feature
Test Button	Standard feature
Reset Button	Standard feature
CT Loop Monitoring	Standard feature
Output Contacts	Isolated Form A and Form B
Approvals	UL Listed (E340889), CSA, CE (European Union) C Tick (Australian)
Analog Output	0–5V & 0–1mA
Conformally coated	Optional
Warranty	5 years
Mounting	DIN, Surface (standard) Panel (with PMA-55 or PMA-60 adapter)

SE-601 Series

DC Earth Fault Relay

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	POWER SUPPLY
SE-601-OU	120/240 VAC/VDC
SE-601-0D	12/24 VDC
SE-601-0T	48 VDC

ACCESSORIES	REQUIREMENT
SE-GRM Series	Required
PGA-0500	Optional
PMA-55	Optional
PGA-60	Optional

Description

The SE-601 is a microprocessor based earth fault relay for ungrounded dc systems. It provides sensitive earth fault protection without the problems associated with nuisance tripping. Earth fault current is sensed using an SE-GRM Series Ground Reference Module - a resistor network that limits ground fault current to 25mA. The SE-601 is used on ungrounded dc systems ranging from industrial 24 VDC control circuits to 1000 VDC solar and transportation systems.

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (1–20mA)	Ten settings provide a wide range of low level protection
Adjustable time delay (50ms–2.5s)	Adjustable trip delay allows quick protection or delayed response
Output contacts	Form A and Form B output contacts for operation of separate annunciation and trip circuits
Analog output (0–5 V & 0–1 mA)	Provides means for connecting to a meter (PGA-0500) or a control system
Non volatile trip Memory	Retains trip state when de energised to simplify troubleshooting
Selectable contact operating mode	Selectable fail safe or non fail safe operating modes allow connection to shunt or undervoltage breaker coil
Microprocessor based	No calibration required saves on maintenance cost

Accessories

A

SE-GRM Series Ground Reference Module
Required accessory, used to connect the SE-601 DC Ground Fault Monitor to the DC bus.

PGA-0500 Analog % Current Meter
Optional panel mounted analog meter displays ground fault current as a percentage of 22mA.

Specifications

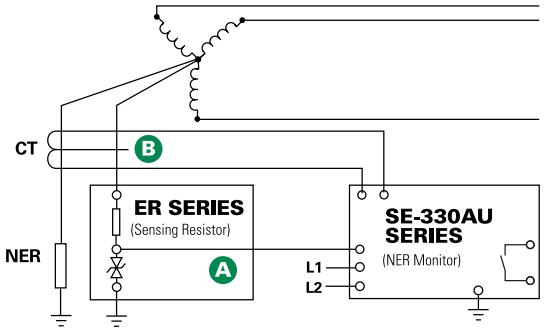
IEEE Device Numbers	DC Overcurrent Relay (76G)
Input Voltage	See ordering information
Dimensions	**H** 75mm **W** 55mm **D** 115mm
Trip Level Settings	1–20mA
Trip Time Settings	0.05–2.5s
Output Contacts	Isolated Form A and Form B
Contact Operating Mode	Selectable fail safe or non fail safe
Test Button	Local
Reset Button	Local and remote
Analog Output	0–5V
Conformally Coated	Consult factory
Approvals	CSA certified, UL Listed (E340889), CE (European Union), C Tick (Australian)
Warranty	5 years
Mounting	DIN, Surface (standard) Panel (with PMA-55 or PMA-60 adapter)

FUSECO

SE-330AU Series

Neutral Earthing Resistor Monitor

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER		POWER SUPPLY	COMM			K4 – UNIT HEALTHY
SE-330AU	–	X	X	–	0	X
SE-330AU for all apps. 35 kV or less		0=120/240 VAC/VDC 2=48 VDC	0=USB Only 1=DeviceNet 3=EtherNet (Dual RJ45) 4=EtherNet (SC Fibre & RJ45) 5=EtherNet (Dual SC Fibre) 6=IEC61850 (Dual RJ45) 7=IEC61850 (SC Fibre & RJ45) 8=IEC61850 (Dual SC Fibre)			0=Normally Open 1=Normally Closed

ACCESSORIES	REQUIREMENT
ER Series Sensing Resistor	Required
Current Transformer	Required
SE-IP65CVR-G	Optional
SE-MRE-600	Optional
RK-332	Optional

Description

The SE-330AU is an advanced earth fault and earthing resistor monitoring relay for low voltage and medium voltage transformers and generators. It monitors neutral current, neutral to earth voltage, and neutral to earth resistance. It provides continuous monitoring of the neutral to earth path to verify that the neutral earthing resistor (NER) is intact. This is of utmost importance, an open NER renders current sensing earth fault protection inoperative and could result in a false belief that the system is functioning properly. Outputs include four relay outputs, and an analog output. A mini USB port is included to view measured values, configure settings, and check event records. An on board micro SD card can be used for long term data logging. Network communications options are available. For non AS/NZS 2081 applications, see the SE-330 or SE-330HV.

Resistor Monitoring

The SE-330AU combines the measured values of resistance, current, and voltage to continuously determine that the NER is intact. It is able to detect a resistor failure with or without an earth fault present. Sensing resistors are matched to the system voltage and are used to monitor NERs on systems up to 35 kV. The SE-330AU resistor monitoring function is compliant with AS/NZS 2081.8:2011.

Earth Fault Monitoring

The SE-330AU uses a 5A or 30A primary current transformer to provide a pickup setting range of 0.125 to 5A or 0.75 to 30A to comply with AS/NZS 2081.6:2011. DFT filtering ensures that false trips due to harmonic noise from variable speed drives do not occur. Open CT detection is provided.

Accessories

A

ER Series Sensing Resistor
Required interface between the power system and the
SE-330AU. Eliminates hazardous voltage levels at the relay.

EFCT Series Earth Fault Current Transformer
Sensitive earth fault current detection (5 A primary).

SE-CS30 Series Earth Fault Current Transformer
Sensitive earth fault current detection (30 A primary).

SE-IP65CVR-G Hinged Transparent Cover
Watertight cover, tamper resistant, IP65 protection.

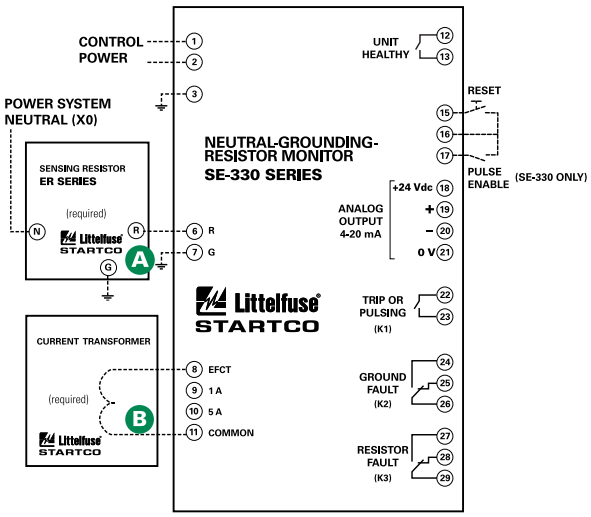
Features & Benefits

FEATURES	IEEE #	BENEFITS
Continuous open NER monitoring	3	Detect NER failure in accordance with ASNZS 2081.8:2011
Continuous shorted NER detection	3	Detect NER failure in accordance with ASNZS 2081.8:2011
AS/NZS 2081:2011 NER monitoring LED indication		LED indication to verify that sensitive open and short NER detection as required by AS/NZS 2081:2011 are configured and active
Earth fault detection	50G/N, 51G/N, 59N	Detect earth faults in accordance with ASNZS 2081.6:2011
Adjustable earth fault pickup		Pick up range 0.125 to 5A or 0.75 to 30A
Adjustable earth fault time delay		Trip time settings 0.10 to 0.50 seconds
Programmable output contacts		Two programmable Form C and One programmable Form A (can be set to combinations of Master Trip, NER Open Fault, NER Short Fault, Earth Fault, Unit Health)
Selectable contact operating mode		Selectable failsafe or non-failsafe operating modes allows connection to shunt or undervoltage breaker coil or alarm circuit (K2 and K3 output contacts)
Analog output (4 - 20 mA)		Connect an optional PGA-0520 meter or control system
Trip records		On-board 100-event (with date and time) recorder helps with system diagnostics
Harmonic filtering (DFT)		Eliminate false trips due to harmonic noise from ASDs
Local communications		Mini USB port to view measured values, configure settings, and check event records
Data logging		On-board microSD card (included) can be used for long-term data logging
Network communications		Remotely view measured values and event records, reset trips, and cause a remote trip. Available Protocol Options: **IEC 61850** - with dual RJ45, SC Fiber and RJ45, or Dual SC Fiber Interface **Modbus TCP and Ethernet/IP** - with dual RJ45, SC Fiber and RJ45, or Dual SC Fiber Interface **DeviceNet** - with CAN interface
Software		PC-interface software (SE-MON330) is available at Littelfuse.com/RelaySoftware
Geo-magnetic filter		Prevents changes in Earth's magnetic field from thunderstorms and other events from causing nuisance trip events
Unit healthy output		Verifies SE-330AU is operating correctly, available as Form A or Form B output contact
Conformal coating		Internal circuits are conformally coated to protect against corrosion and moisture

Specifications

IEEE Device Numbers	Ground Fault (50G/N, 51G/N, 59N) Checking Relay (3), Lockout Relay (86)
Input Voltage	See ordering information
Dimensions	**H** 213mm **W** 98mm **D** 132mm
EF Trip-Level Settings	125mA -5A (with EFCT series CT) 750mA -30A (with SE-CS30 series CT)
EF Trip-Time Settings	100-500ms
Vn Trip-Level Settings	20-2,000 VAC (<5 kV systems) 100-10,000 VAC (>5 kV systems)
Contact Operating Mode	K1 & K4 Fail-safe K2 & K3 Selectable fail-safe or non-fail-safe
Harmonic Filtering	Discrete-Fourier Transform (DFT) standard
Reset	Remote and front-panel button
Output Contacts	Two Form A and two Form C
Approvals	AS2081:2011 section 6 (EF) & 8 (NER) CSA certified, UL Listed (E340889), CE (European Union), RCM (Australia), FCC
Communications	mini USB (standard) DeviceNet, Ethernet, IEC 61850 (optional)
Analog Output	4-20mA, self or loop powered
Conformally Coated	Standard feature
Warranty	5 years
Mounting	Panel and Surface

Wiring Diagram



FUSECO

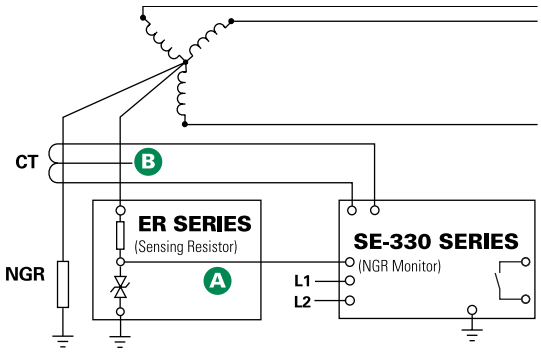
SE-330, SE-330HV Series

Neutral Earthing Resistor Monitor

Description

The SE-330 is an advanced earth fault and neutral earthing resistor monitoring relay. It measures neutral current, neutral to earth voltage, and neutral to earth resistance. It provides continuous monitoring of the neutral to earth path to verify that the neutral earthing resistor (NER) is intact. This is of utmost importance, an open NER renders current sensing earth fault protection inoperative and could result in a false belief that the system is functioning properly. The SE-330 can be used with low and medium voltage transformers and generators with low or high resistance earthing used in processing, manufacturing, chemical, pulp and paper, petroleum, and water treatment facilities. For high voltage applications, use the SE-330HV. For applications that require conformance to Australian standard AS/NZS 2081.8:2011, see the SE-330AU.

Simplified Circuit Diagram



Resistor Monitoring

The SE-330 combines the measured values of resistance, current, and voltage to continuously determine that the NER is intact. It is able to detect a resistor failure with or with out an earth fault present. Sensing resistors are matched to the system voltage and are used to monitor NERs on systems up to 72kV.

Earth Fault Monitoring

The SE-330 uses an application appropriate current transformer to reliably detect earth fault currents as small as 100 mA. DFT filtering ensures that false trips due to harmonic noise from variable speed drives do not occur. Should the NER open and an earth fault subsequently occur, the SE-330 will detect the fault through voltage measurement, while other current only sensing relays would be ineffective.

Ordering Information

ORDER NUMBER		POWER SUPPLY	COMM			K4 – UNIT HEALTHY
SE-330	–	X	X	–	0	X
SE-330 for applications 35 kV or less **SE-330HV** for 72 kV applications		0=120/240 VAC/VDC 2=48 VDC	0=USB Only 1=DeviceNet 3=EtherNet (Dual RJ45) 4=EtherNet (SC Fibre & RJ45) 5=EtherNet (Dual SC Fibre) 6=IEC61850 (Dual RJ45) 7=IEC61850 (SC Fibre & RJ45) 8=IEC61850 (Dual SC Fibre)			0=Normally Open 1=Normally Closed

ACCESSORIES	REQUIREMENT
ER Series Sensing Resistor	Required
Current Transformer	Required
SE-IP65CVR-G	Optional
SE-MRE-600	Optional
RK-332	Optional

Accessories

A

ER Series Sensing Resistor
Required interface between the power system and the /wwHV. Eliminates hazardous voltage levels at the relay.

B

EFCT Series Earth Fault Current Transformer
Sensitive earth fault current detection (5A primary).

SE-CS30 Series Earth Fault Current Transformer
Sensitive earth fault current detection (30A primary).

Other Current Transformer
For low resistance NGRs choose a CT primary approximately equal to the NGR rating.

SE-IP65CVR-G Hinged Transparent Cover
Watertight cover, tamper resistant, IP65 protection.

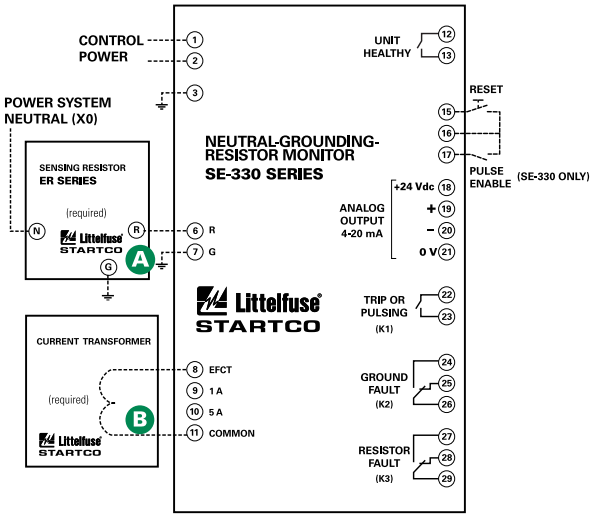
Features & Benefits

FEATURES	IEEE #	BENEFITS
Continuous NER monitoring	3	Detects open NER failure within 10 seconds, reduces transient over voltage risk, removes risk of ground fault detection failure
Shorted NER detection	3	Detects a ground fault on the neutral that could bypass the resistor, ensures fault current is not higher than expected
Earth Fault detection	50G/N, 51G/N, 59N	Main or backup protection to detect an earth fault anywhere in the system
Adjustable pickup (2–100%)		Pick up range 2-100% of CT primary
Adjustable time delay (0.1–10s)		Trip Time settings 0.10 to 10 seconds
Universal CT compatibility		Allows the use of a CT that gives required ground fault settings
Programmable output contacts		Two programmable Form C and One programmable Form A (can be set to combinations of Master Trip, NER Open Fault, NER Short Fault, Earth Fault, Unit Health)
Analog output (4–20mA)		Connect an optional PGA-0520 meter or control system
Trip records		On board 100 event (with date and time) recorder helps with system diagnostics
Harmonic filtering (DFT)		Eliminate false trips due to harmonic noise from ASDs
Local communications		Mini USB port to view measured values, configure settings, and check event records
Data logging		On board microSD card (included) can be used for long term data logging
Network communications		Remotely view measured values and event records, reset trips, and cause a remote trip Available Protocol Options: **IEC 61850** – with dual RJ45, SC Fibre and RJ45, or Dual SC Fibre Interface **Modbus TCP and Ethernet/IP** – with dual RJ45, SC Fibre and RJ45, or Dual SC Fibre **Interface DeviceNet** – with CAN interface
Software		PC interface software (SE-MON330) is available at Littelfuse.com/RelaySoftware
Selectable reset mode		Selectable latching or auto reset operation
Unit healthy output		Verifies SE-330 is operating correctly, available as Form A or Form B output contact
Conformal coating		Internal circuits are conformally coated to protect against corrosion and moisture

Specifications

IEEE Device Numbers	Ground Fault (50G/N, 51G/N, 59N), Checking Relay (3), Lockout Relay (86)
Input Voltage	See ordering information
Dimensions	**H** 213mm **W** 98mm **D** 132mm
GF Trip Level Settings	2–100% of CT Primary Rating in 1% increments
GF Trip Time Settings	0.1–10s
Vn Trip Level Settings	20–2,000 VAC (≤5 kV systems) 100–10,000 VAC (>5 kV systems)
Contact Operating Mode	Selectable fail safe or non fail safe (K1, K2, K3)
Harmonic Filtering	Standard feature
Reset Button	Standard feature
Output Contacts	Two Form A and two Form C
Pulsing Circuit	1.0–3.0s in 0.2s increments (SE-330 only)
Approvals	CSA certified, UL Listed (E340889), CE (European Union), RCM (Australian)
Communications	Mini USB (standard); DeviceNet (optional), IEC 61850 (optional), Modbus TCP and EtherNet/IP (optional)
Analog Output	4–20mA, self or loop powered
Conformally Coated	Standard feature
Warranty	5 years
Mounting	Panel, Surface (optional)

Wiring Diagram



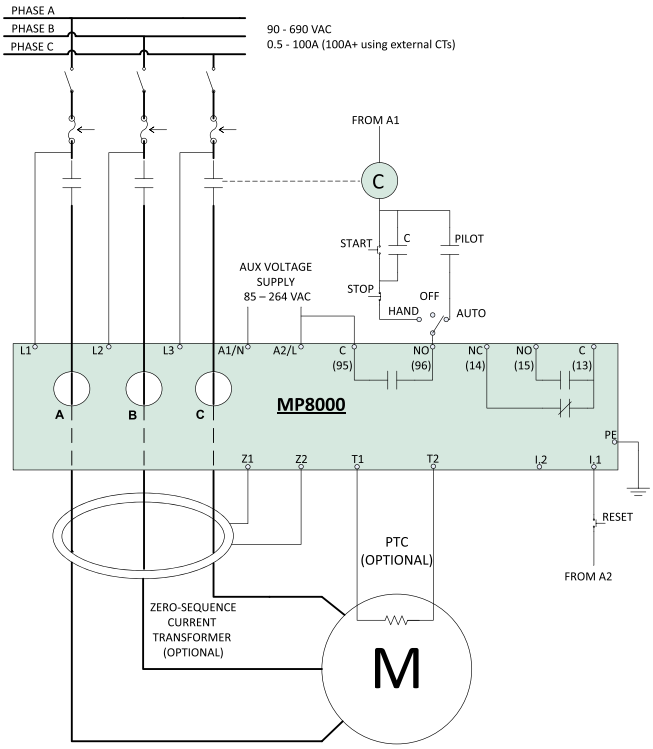
FUSECO

MP8000

Motor Protection Relay

Wiring Diagram

TYPICAL WIRING DIAGRAM FOR 3-PHASE



Description

The MP8000 is an advanced motor protection electronic overload relay that is fully programmable via Bluetooth using the Littelfuse app on an Android or iPhone mobile device. It is easy to use and arc flash safety is increased because the app allows settings to be modified and real time operational information viewed. Viewing operational information and faults on the app does not require the user to open the control panel. The MP8000 protects any motor drawing 0.5–1,000 full load Amps (external CT's are required above 100 amperes). It is designed for single or 3 phase systems with operating voltages of 90–690 VAC (use of external potential transformers can extend upper voltage range above 690 VAC). Common applications include conveyor systems, HVAC equipment, saws and grinders, fan motors, and almost any pumping application. Protection is unsurpassed by combining overload, voltage, phase loss and reversal, voltage and current unbalance, power monitoring, and underload in one package. For standalone applications, the Bluetooth interface can be used when paired with a smartphone or tablet. The units also feature an Ethernet communications port that can be used to form an Ethernet Modbus TCP/IP network or Ethernet/IP. Units can be remotely monitored and controlled from a PC, or SCADA system, and data logging through a PC with the optional Solutions software or other software program using the MP8000 memory map. This capability allows for a simple cost effective way to further enhance arc flash safety.

Features & Benefits

FEATURES	BENEFITS
Bluetooth interface	Visual indication for programming, viewing real time voltage or current, and last fault information (date and time stamped)
Programmable voltage and current settings	Allows usage on wide range of systems
3 selectable restart options	Choose from automatic, semi automatic, or manual to best meet individual application needs
4 programmable delay timers	Program separate delay times for power up, rapid cycle protection, motor cool down, and underload restarting
Flexible reset	Reset can be done through pushbutton on panel, remotely via the network
Network communications capability	Compatible with Ethernet Modbus TCP/IP and Ethernet/IP

Accessories

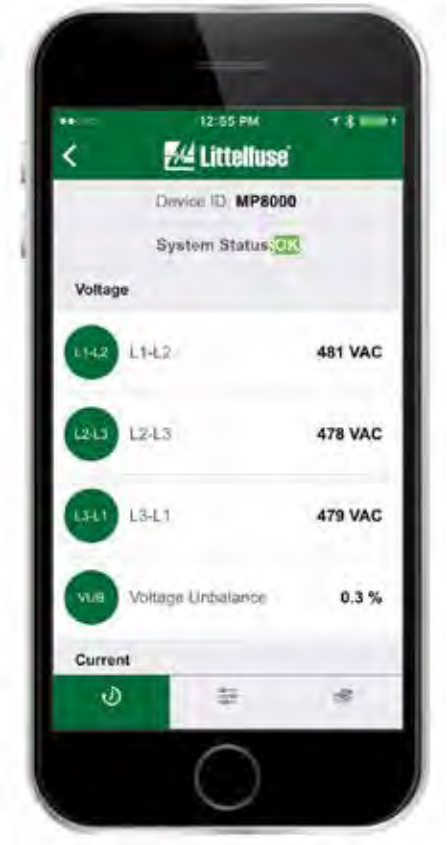
ZSCT Series Current Transformer
Used with Littelfuse relays to detect low levels of earth leakage current.

Ordering Information

MODEL	LINE VOLTAGE	MOTOR FULL AMP RANGE	DESCRIPTION
MP8000	90–690VAC (use of external potential transformers can extend upper voltage range above 690VAC)	0.5–1,000A+ (external CT's required above 100A)	Provides remote wired communication via Ethernet Modbus TCP/IP or Ethernet/IP

Advanced Features

- Overload/Overpower (49)
- Underload/Underpower (37P)
- Overcurrent (51)/Jam
- Undercurrent (37)
- Current Unbalance/Phase Loss (46)
- Phase Reversal (47)
- Overvoltage (59)
- Undervoltage (27)
- Voltage Unbalance (47)
- Rapid Cycling/Jog
- Contactor Failure
- Zero Sequence Ground Fault (50Ns)
- PTC Motor Overtemperature (49)



MP8000
Littelfuse App icon

Available on the App Store

GET IT ON Google Play

Specifications

Functional Characteristics	
Frequency	50/60Hz
TC Overcurrent Trip Class	Trip class 02–60 or linear
Output Characteristics	
Output Contact Rating Control relay	SPST – Form A
Auxiliary relay	SPDT – Form C
Pilot Duty Rating	B300
General Purpose	5A @ 240 VAC
General Characteristics	
Ambient Temperature Range	
Operating	–40° to 70°C
Storage	–40° to 85°C
Accuracy	
Voltage	±1% of reading ±0.5 V
Current	±2% (2 to 100 amperes direct)
Timing	+/–0.5% of setting +/– 1second
GF Current	±5%
Repeatability	
Voltage	±0.5%
Current	±1% (2 to 100 A direct)
Power Consumption	<5 W
Pollution Degree	3 (conformal coating standard)
Class of Protection	IP20
Relative Humidity	10–95%, non condensing per IEC 68-2-3
Terminal Torque (deplug-gable terminal blocks)	5.5 in.–lbs.
Terminal Torque (Earth Ground)	7.9 in.–lbs.
Standards Passed	
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity (RFI), Conducted	IEC 61000-4-6, Level 3 10V/m
Radio Frequency Immunity (RFI), Radiated	IEC 61000-4-3, Level 3 10V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 3.5kV input power Surge IEC 61000-4-5, Level 3, 2kV line to line; Level 4, 4kV line to ground
FCC Rating	Part 15.107 for emissions, Part 15.247 for intentional radiators
Short Circuit Withstand Rating	100kA symmetrical at 690VAC
Hi Potential Test	Meets UL508 (2 x rated V +1000V for 1 minute)
Safety Marks	
cULus	UL60947, UL1053, C22.2 (File #E68520)
CE	IEC 60947 Edition 5.2, IEC 60947-8
Maximum Conductor Size (with insulation)	0.63"
Dimensions	**H** 74.42mm **W** 103.63mm **D** 121.67mm
Weight	385.6g
Mounting Method	Surface mount (4 – #8 screws) or DIN rail mount

FUSECO

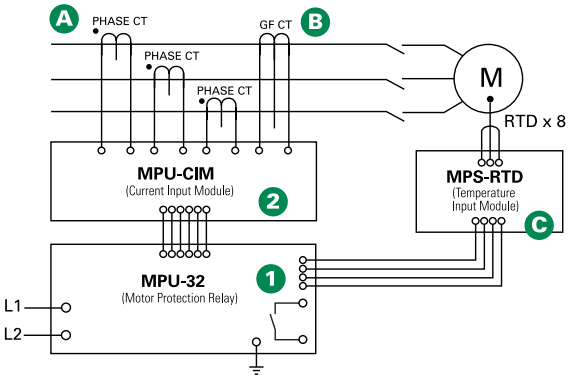
MPU-32 Series

Motor Protection Unit

1

2

Simplified Circuit Diagram



Description

The MPU-32 Motor Protection Unit is used to provide currentand temperature based protection, metering, and data logging for three phase low voltage medium horsepower induction motors. This relay is ideal for retrofitting and upgrading obsolete or aging motor protection using existing CT's. See the PMA Family of Panel Mount Adapter Kits to replace common obsolete relays.

1 Motor Protection Unit

- Three ac current inputs
- Earth leakage CT input
- Programmable digital input
- 24 VDC source for digital input
- Programmable 4–20-mA analog output
- On board temperature sensor input,
- 100-Ω-Platinum RTD or PTC
- Three programmable output relays
- Local RS-232 communications, optional Network Communications
- PC interface software (SE-Comm-RIS)
- 4 line x 20 character backlit LCD display
- Keypad for programming and display selection
- 4 LEDs; 1 user programmable

2 Current Input Module (MPU-CIM)

The MPU-CIM Current Input Module is the interface between the MPU-32 relay and the 5A secondary, 1A secondary, and sensitive current transformers. The MPU-CIM is ordered separately from the MPU-32 and can be surface or DIN rail mounted. Wire clamping terminals are standard but the MPUCTI is available for those who require ring tongue terminals.

Ordering Information

ORDER NUMBER	POWER SUPPLY
MPU-32-00-00	TIA-232
MPU-32-01-00	TIA-232 & TIA-485
MPU-32-02-00	TIA-232 & DeviceNet™
MPU-32-04-00	TIA-232 & EtherNet/IP™ & Modbus® TCP

NOTE: One of the following is required: MPU-CIM-00-00 Current Input Module, or MPU-CTI-RT-00 Current Input Module with ring tonque terminals

ACCESSORIES	REQUIREMENT
Phase CT's	Required
MPS-RTD-01-00	Optional
MPS-DIF-01-00	Optional
MPU-32-SMK	Optional
CA-945	Optional
MPU-16A-Y92A-96N	Optional

Accessories

A

Phase Current Transformers
Phase CT's are required to detect phase currents. For upgrade applications, existing CT's can be used.

B

Ground Fault Current Transformer
Optional zero sequence current transformer detects ground-fault current. Available with 5A and 30A primary ratings for low-level pickup.

C

MPS-RTD Temperature Input Module
Optional module provides 8 inputs to connect Pt100, Ni100, Ni120, and Cu10 RTDs.

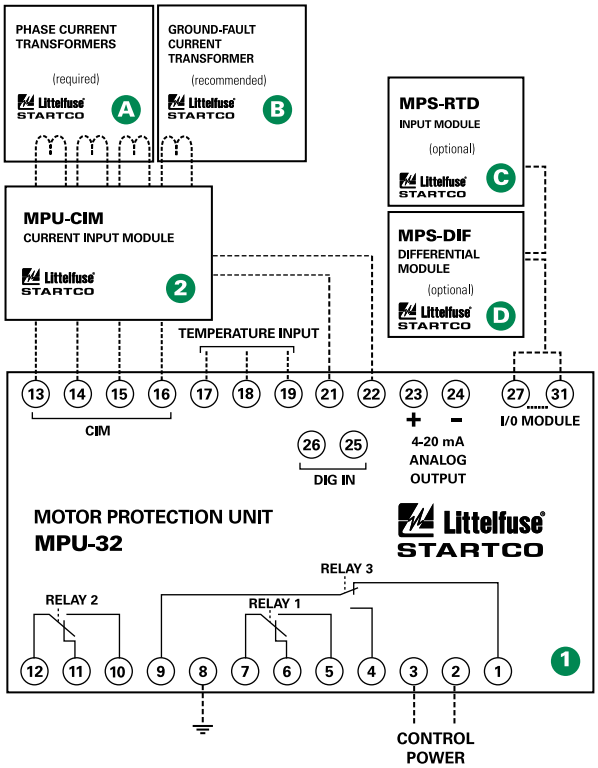
D

MPS-DIF Differential Current Module
Optional motor differential protection, compatible with core balance and summation current transformer connections.

Features & Benefits

FEATURES	IEEE #	BENEFITS
Overload	49, 51	Extends motor life and prevents insulation failures and fires
Dynamic thermal model		Provides protection through starting, running, and cooling cycles
Communications		Remotely view measured values and event records, reset trips, and access setpoints
Ground fault	50G/N, 51G/N	Prevents catastrophic failures and fires
Current unbalance/ Phase loss/Phase reverse	46	Prevents overheating due to unbalanced phases
RTD temperature	38, 49	RTD temperature protection (MPS-RTD module) for high ambient or loss of ventilation protection
Phase loss/Phase reverse (current)	46	Detects unhealthy supply conditions
Overcurrent	50, 51	Prevents catastrophic failures and fires; extends motor life
Jam		Prevents motor damage by detecting mechanical jams or excessive loading
Undercurrent	37	Detects low level or no load conditions
PTC overtemperature	49	Overtemperature (PTC) protection for high ambient or loss of ventilation detection
Starts per hour	66	Limits the motor starts per hour to prevent overheating
Differential	87	Optional MPS-DIF module for sensitive winding fault protection
Reduced overcurrent mode		Minimizes arc flash hazards during maintenance
Metering		View measured and calculated parameters with on board display
MPU-CIM		Separate current input module to reduce risk of open CT hazard and for convenient installation
Analog output		Provides means for metering selectable parameters
Data logging		On board 100 event recorder for data logging
Conformal coating		Internal circuits are conformally coated to protect against corrosion and moisture

Wiring Diagram



Specifications

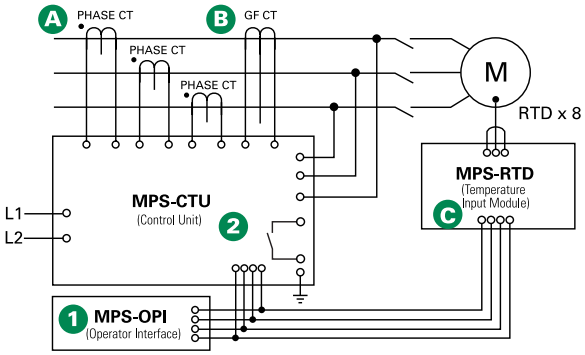
Protective Functions (IEEE Device Numbers)	Overload (49, 51) Phase reverse (current) (46) Overcurrent (50, 51) Jam Ground fault (50G/N, 51G/N) PTC overtemperature (49	RTD temperature (38, 49) Unbalance (current) (46) Starts per hour (66) Differential (87) Phase loss (current) (46) Undercurrent (37)
Input Voltage	65-265 VAC, 25 VA; 80-275 VDC, 25 W	
Power-Up Time	800ms at 120 VAC	
Ride-Through Time	100ms minimum	
24 VDC Source	100mA maximum	
AC Measurements	True RMS and DFT, Peak, 16 samples/cycle, and positive and negative sequence of fundamental	
Frequency	50, 60 Hz or ASD	
Output Contacts	Three Form C programmables	
Communications	TIA-232 (standard); TIA-485, DeviceNet™, Ethernet (optional)	
Analog Output	4–20mA, programmable	
Conformally Coated	Standard feature	
Warranty	10 years	
Mounting		
(Control Unit)	Panel (standard) Surface (with MPU-32-SMK converter kit)	
(Current Input Module)	DIN, Surface	
Approvals	CSA certified, CE (European Union), UL Recognized, C Tick (Australian)	

FUSECO

MPS Series

Motor Protection System

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	COMMUNICATIONS
MPS-CTU-01-00	RS-485
MPS-CTU-02-00	RS-485 & DeviceNet™
MPS-CTU-03-00	RS-485 & Profibus®
MPS-CTU-04-00	RS-485 & EtherNet/IP™ & Modbus® TCP

ACCESSORIES	REQUIREMENT
MPS-OPI-01-00	Recommended
Phase CT's	Required
Ground Fault CT	Recommended
MPS-RTD-01-00	Optional
MPS-DIF-01-00	Optional
SE-IP65CVR-M	Optional

Description

The MPU-32 Motor Protection Unit is used to provide currentand temperature based protection, metering, and data logging for three phase low voltage medium horsepower induction motors. This relay is ideal for retrofitting and upgrading obsolete or aging motor protection using existing CT's. See the PMA Family of Panel Mount Adapter Kits to replace common obsolete relays.

1 Motor Protection Unit

- Three ac current inputs
- Earth leakage CT input
- Programmable digital input
- 24 VDC source for digital input
- Programmable 4–20-mA analog output
- On board temperature sensor input,
- 100-Ω-Platinum RTD or PTC
- Three programmable output relays
- Local RS-232 communications, optional Network Communications
- PC interface software (SE-Comm-RIS)
- 4 line x 20 character backlit LCD display
- Keypad for programming and display selection
- 4 LEDs; 1 user programmable

2 Current Input Module (MPU-CIM)

The MPU-CIM Current Input Module is the interface between the MPU-32 relay and the 5A secondary, 1A secondary, and sensitive current transformers. The MPU-CIM is ordered separately from the MPU-32 and can be surface or DIN rail mounted. Wire clamping terminals are standard but the MPUCTI is available for those who require ring tongue terminals.

Accessories

A

Phase Current Transformers
Phase CT's are required to detect phase currents.

B

Ground Fault Current Transformer
Optional zero sequence current transformer detects ground fault current. Available with 5A and 30A primary ratings for low level pickup.

C

MPS-RTD Temperature Input Module
Optional module provides 8 inputs to connect Pt100, Ni100, Ni120, and Cu10 RTDs.

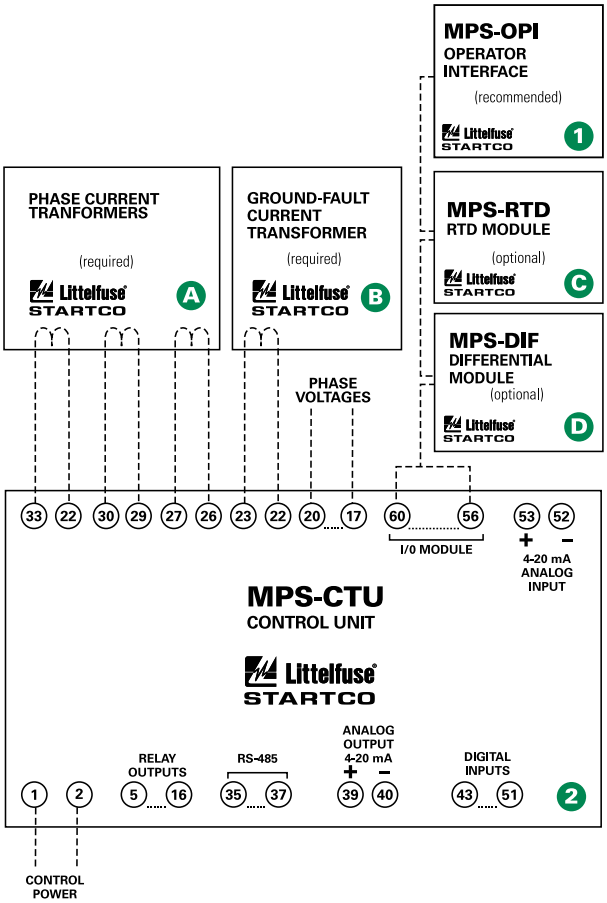
D

MPS-DIF Differential Current Module
Optional motor differential protection, compatible with core balance and summation current transformer connections.

Features & Benefits

FEATURES	IEEE #	BENEFITS
Overload	49, 51	Extends motor life and prevents insulation failures and fires
Current unbalance/ Phase loss/Phase reverse	46	Prevents overheating and extends motor life
Overcurrent/Jam	50, 51	Prevents catastrophic failures and fires and extends motor life
Undercurrent	37	Detects low level or no load conditions
Ground fault	50G/N, 51G/N	Prevents catastrophic failures and fires
RTD temperature	38, 49	Optional RTD temperature protection (MPS-RTD module) for high ambient or loss of ventilation protection
Overvoltage	59	Prevents stress to insulation
Undervoltage	27	Prevents a start attempt when it will damage the motor
Voltage unbalance	47	Detects unhealthy supply voltage
Phase differential	87	Provides sensitive protection for high resistance winding faults
Dynamic thermal mode		Provides protection through starting, running, overload, and cooling cycles
Reduced overcurrent mode		Minimizes Arc Flash hazards during maintenance
Starter control		Simplifies the installation by reducing component count
Metering		Displays the measured and calculated motor parameters
Data logging		On board 64-event recorder helps with system diagnosis
Communications		Remotely view measured values, event records & reset trips
Conformal coating		Internal circuits are conformally coated to protect against corrosion and moisture

Wiring Diagram



Specifications

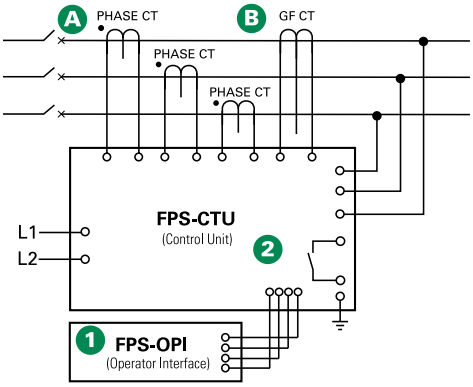
Protective Functions (IEEE Device Numbers)	Overload (49, 51) Phase reverse (current) (46) Overfrequency (81) Overcurrent (50, 51) Jam Underfrequency (81) Ground fault (50G/N, 51G/N) Undercurrent (37) Unbalance (voltage) (47) Failure to accelerate (47) Power factor (55) RTD temperature (38, 49) Unbalance (current) (46) Underspeed (14) Starts per hour (66) Phase loss (voltage) (47) Overvoltage (59) Differential (87) Phase loss (current) (46) Undervoltage (27) Phase reverse (voltage)
Input Voltage	65–265 VAC, 25 VA; 80—275 VDC, 25 W
Power Up Time	800ms at 120 VAC
Ride Through Time	100ms minimum
24 VDC Source	100mA maximum
AC Measurements	True RMS and DFT, Peak, 16 samples/cycle, and positive and negative sequence of fundamental
Frequency	50, 60 Hz or ASD
Inputs	Phase current, Earth leakage current, Phase voltage, 7 digital, tachometer, 1 analog
Output Contacts	5 contacts — See Product Manual
Approvals	CSA Certified, RCM (Australian), UL Recognized
Communications	Allen-Bradley® DFI and Modbus® RTU (Standard); DeviceNet™, Profibus®, Ethernet (Optional)
Conformally Coated	Standard feature
Warranty	10 years
Mounting	
(Control Unit)	Surface
(Operator Interface)	Panel, Control Unit mounted

FUSECO

FPS Series

Feeder Protection System

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	OPTION
FPS-CTU-01-00	RS-485
FPS-CTU-02-00	RS-485 & DeviceNet™
FPS-CTU-03-00	RS-485 & Profibus®
FPS-CTU-04-00	RS-485 & Ethernet

ACCESSORIES	REQUIREMENT
FPS-OPI-01-00	Recommended
SE-IP65CVR-M	Optional
Phase CT's	Required
Ground-Fault CT	Recommended
MPS-RTD-01-00	Optional

Description

The FPS Feeder Protection System monitors voltage and current to provide a comprehensive package of 17 protective functions. The FPS is a modular system with integrated protection, breaker control, metering, and data logging functions.

1 Operator Interface (FPS-OPI)

- Large, bright, 4 x 20 vacuum fluorescent display
- Display metered values
- Access set points
- Powered by Control Unit
- Panel mount or attach directly to Control Unit
- Remote mounting (1.2km or 4000ft maximum loop length)
- 1/2 DIN size
- Hazardous-location certified

2 Control Unit (FPS-CTU)

- Current inputs – 5A or 1A secondary phase current transformers
- Voltage inputs – up to 600 V without PTs
- Earth-leakage input – 5A or 1A secondary or sensitive transformer
- 8 digital inputs, 5 relay outputs, 1 analog input and output
- 24 VDC supply for OPI and RTD modules, and for digital inputs
- IRIG-B time-code input
- 1/2 DIN size, surface mount
- RS-485 network communications (Standard)
- DeviceNet™, Profibus®, or Ethernet communications available

Accessories

A

Phase Current Transformers
Phase CT's are required to detect phase currents.

B

Ground-Fault Current Transformer
Zero-sequence current transformer detects ground-fault current. Available with 5A and 30A primary ratings for low-level pickup.

C

MPS-RTD Temperature Input Module
Optional module provides 8 inputs to connect Pt100, Ni100, Ni120, and Cu10 RTDs.

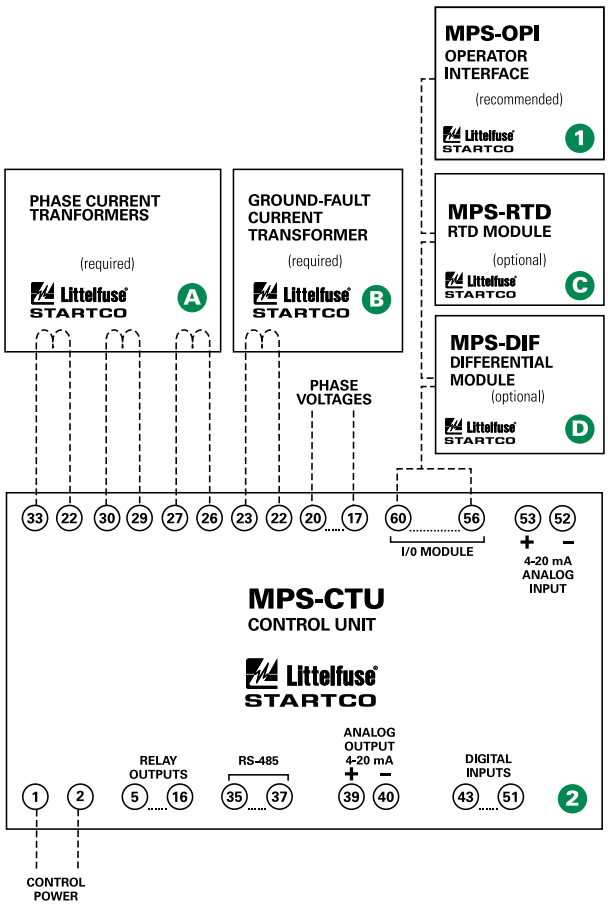
D

SE-IP65CVR-M Cover
Optional gasketed, transparent cover for limited access and IP65 protection for an Operator Interface Module.

Features & Benefits

FEATURES	IEEE #	BENEFITS
Overload	49, 51	Long time overcurrent provides thermal protection for feeder or load
Inverse-time overcurrent	50, 51	Coordination using IEEE and IEC Curves
Definite-time overcurrent	50, 51	Instantaneous overcurrent to detect catastrophic failure
Current unbalance/Phase loss/Phase reverse	46	Detects an open or high impedance phase
Ground fault	50G/N, 51G/N	Inverse and definite time. Early insulation failure detection.
RTD temperature	38, 49	Optional protection (MPS-RTD module) for load temperature monitoring
Overvoltage	59	Limits stress to insulation
Undervoltage	27	Detects a damaging brown out condition
Voltage unbalance	47	Detects unhealthy supply voltage
Two setting groups		Minimizes Arc-Flash hazards during maintenance
Breaker control		Allows local and remote operation; reduces component count
Metering		Displays the measured and calculated parameters
Data logging		On-board 64-event recorder helps with system diagnosis
Communications		Remotely view measured values, event records, & reset trips
Conformal coating		Internal circuits are conformally coated to protect against corrosion and moisture
Communications		Remotely view measured values, event records & reset trips
Conformal coating		Internal circuits are conformally coated to protect against corrosion and moisture

Wiring Diagram



Specifications

Protective Functions (IEEE Device Numbers)	Overload (49, 51) Phase reverse (current) (46) Overfrequency (81) Overcurrent (50, 51) Underfrequency (81) Ground fault (50G/N, 51G/N) Unbalance (voltage) (47) RTD temperature (38, 49)	Unbalance (current) (46) Phase loss (voltage) (47) Overvoltage (59) Phase loss (current) (46) Undervoltage (27) Phase reverse (voltage) (47) Power factor (55)
Input Voltage	665-265 VAC, 25 VA; 80-275 VDC, 25 W	
Power Up Time	800ms at 120 VAC	
Ride Through Time	100ms minimum	
24 VDC Source	100mA maximum	
AC Measurements	True RMS and DFT, Peak, 16 samples/cycle, and positive and negative sequence of fundamental	
Frequency	50, 60 Hz	
Inputs	Phase current, Earth leakage current, Phase voltage, 7 digital, 1 analog	
Output Contacts	5 contacts — See Product Manual	
Approvals	CSA certified, C-Tick (Australian)	
Communications	Allen-Bradley® DFI and Modbus® RTU (Standard); DeviceNet™, Profibus®, Ethernet (Optional)	
Conformally Coated	Standard feature	
Warranty	10 years	
Mounting		
(Control Unit)	Surface	
(Operator Interface)	Panel, Control Unit mounted	

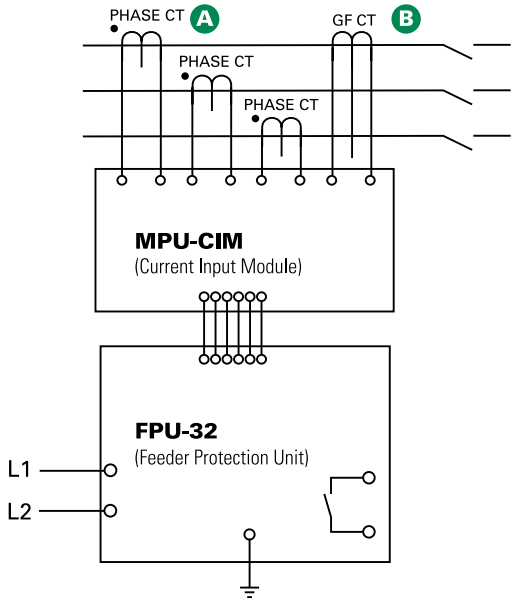
FUSECO

FPU-32 Series

Feeder Protection Unit

NOTE: The FPU-32 consists of the Feeder Protection Unit (pictured above) and the MPU-CIM Current Input Module (not pictured).

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	POWER SUPPLY
FPU-32-00-00	TIA-232
FPU-32-01-00	TIA-232 & RS-485
FPU-32-02-00	TIA-232 & DeviceNet™
FPU-32-04-00	TIA-232 & Ethernet

NOTE: One of the following is required: MPU-CIM-00-00 Current Input Module, or MPU-CTI-RT-00 Current Input Module with ring-tonque terminals.

ACCESSORIES	REQUIREMENT
Phase CT's	Recommended
Ground-Fault CT	Optional
MPU-16A-Y92A-96N	Optional

Description

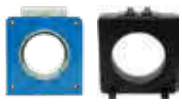
The FPU-32 Feeder Protection Unit provides integrated protection, metering, and data logging functions. It is an excellent choice for retrofitting and upgrading older relays because of its compact size and ability to use existing CT's. The FPU-32 is used to protect distribution feeders in processing, manufacturing, petroleum, chemical, and wastewater treatment facilities.

Features & Benefits

FEATURES	BENEFITS
IEC & IEEE overcurrent protection curves	Definite and inverse time settings for system coordination; prevents catastrophic failures
Two setpoint groups	Create distinctive settings for maintenance or for two different loads
Reduced overcurrent mode	Maintenance mode setting to reduce the risk of arc flash hazards
Data logging	On board 100 event recorder and remote data logging helps with system diagnostics
Overload	Thermal protection for connected load
Phase loss/Phase reverse (current)	Detects unhealthy supply conditions
Unbalance (current)	Prevents overheating due to unbalanced phases
Communications	Remotely view measured values, event records & reset trips

Accessories

Phase Current Transformers
Phase CT's are required to detect phase currents.



Ground-Fault Transformer
Zero-sequence current transformer detects ground fault current. Available with 5A and 30A primary ratings for low-level pickup.

Specifications

Protective Functions (IEEE Device Numbers)	Overload (49, 51) Phase sequence (46) Unbalance (46) Phase loss (46)	Definite-time overcurrent (50, 51) Inverse-time overcurrent (50, 51) Ground fault (50G/N, 51G/N) RTD/PTC temperature (49)
Input Voltage	65–265 VAC, 30 VA; 80–275 VDC, 25 W	
Power-Up Time	800ms at 120 VAC	
Ride-Through Time	100ms minimum	
24 VDC Source	400mA maximum	
AC Measurements	True RMS and DFT, Peak 32 samples/cycle and positive and negative sequence of fundamental	
Frequency	50, 60Hz	
Output Contacts	Three Form C	
Approvals	CSA certified, CE, C Tick (Australian), UL Recognised	
Communications	TIA-232 (standard); TIA-485, DeviceNet™, Ethernet (optional)	
Analog Output	4–20mA, programmable	
Conformally Coated	Standard feature	
Warranty	10 years	
Mounting		
(Control Unit)	Panel (standard) Surface (with MPU-32-SMK converter kit)	
(Current Input Module)	DIN, Surface	

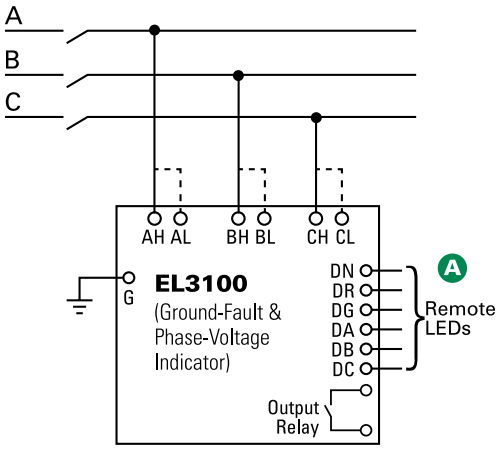
EL3100 Series

Ground Fault & Insulation Monitor

Description

The EL3100 is a self-powered ground fault and phase voltage indication system for 3 phase systems. The EL3100 meets the National Electrical Code (NEC) and the Canadian Electrical Code (CEC) requirements for ground detectors for ungrounded alternating current systems. Voltage connections are provided on the EL3100 for 208, 240, 480, and 600V systems. Three green LED's on the EL3100 indicate the presence of phase to ground voltage and one red LED indicates a ground fault. The EL3100 can operate stand alone or with up to five remote LED indicators. A solid state relay output provides indication of a ground fault. The output relay is closed when the 3 phase neutral voltage shifts as the result of ground leakage.

Simplified Circuit Diagram



Features & Benefits

FEATURES	BENEFITS
NEC® and CEC Code compliant	Meets National Electrical Code (NEC®) Article 250.21 and Canadian Electrical Code Part 1, Section 10-106 (2) requirements for ungrounded systems
Low voltage remote LEDs	System voltage is not present at the remote LED location
Phase voltage indication	Indicates the presence of voltage on both grounded and ungrounded systems
Output relay	Allows for remote ground-fault indication

Accessories

Remote LEDs
High-intensity 16-mm IP67 LED lamps available in red and green colors.

Ordering Information

ORDER NUMBER	MOUNTING
EL3100-00	DIN, Surface

ACCESSORIES	REQUIREMENT
RK-310x-0y	Optional

Note: X=R for red LED and G for green LED
Y=0 for no label and 1 for a ground-fault label

Specifications

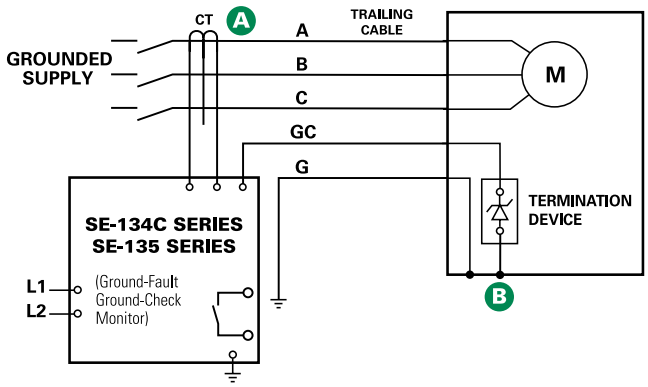
Input Voltage	Input L: 208/240 VAC Input H: 480/600 VAC
Dimensions	**H** 87.0mm **W** 112.5mm **D** 56.0mm
Approvals	CSA certified, UL Listed (E340889)
Conformally Coated	Standard feature
Warranty	5 years
Mounting	DIN, Surface

FUSECO

SE-134C, SE-135 Series

Trailing Cable Relay

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	OPTION	POWER SUPPLY	COMM
SE-134C	Blank or XGC	0=120/240 VAC/VDC 1=24/48 VDC(1)	0=None
SE-135	Blank or XGC	0=120/240 VAC/VDC 1=24/48 VDC(1) (2)	0=None

ACCESSORIES	REQUIREMENT
SE-CS10 Series	Required
SE-CS40 Series (for SE-135)	Optional
SE-TA6A Series (for SE-134C)	Required
SE-TA12A/SE-TA12B Combination (for SE-134C)	Optional
SE-TA12A Series (for SE-135)	Required
SE-IP65CVR-G	Optional
RK-132	Optional
PPI-600V	Optional

(1) CE/C-Tick not available.
(2) Not available with Ethernet option 3.
(3) See ordering information.

Description

The SE-134C/SE-135 is a microprocessor based, combination pilot wire monitor and earth fault relay for resistance grounded or solidly earthed systems. It continuously monitors the integrity of the earth conductor to protect portable equipment from hazardous voltages caused by earth faults. The SE-134C/SE-135 is field proven in monitoring trailing cables on large mobile equipment such as drag lines, mining shovels, shore to ship power cables, dock-side cranes, stacker reclaimers, submersible pumps, and portable conveyors.

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (0.5–12.5A for SE-CS10) (2–50A for SE-CS40)	Unit can be used on a wide variety of trailing cable applications
Adjustable time delay (0.1–2.5s)	Adjustable trip delay for quick protection and system coordination
Output contacts	Separate annunciation of ground fault and ground check faults
Ground-check LED indication	Indication of open or short ground-check wire makes it easier to find faults
CT loop monitoring	Alarms when CT is not connected
High induced ac rejection	Makes unit suitable for applications with high voltages and long cables
DFT (Harmonic) filter	Prevents false operation
Zener-characteristic termination assembly	Provides reliable ground-check loop verification
Fail-safe circuits	Ensures ground-check and ground-fault circuits remain safe even in the event of equipment failure
Conformal coating	Additional coating protects circuit boards against harsh environment
XGC option	Increases maximum cable length for ground-check monitoring (10km typical)

Accessories

A

SE-CS10 or SE-CS40 Series Ground-Fault Current Transformer
Required zero-sequence current transformer detects ground-fault current.

B

SE-TA6A Series, SE-TA12A Series Termination Assembly
Required termination assembly; temperature compensated.

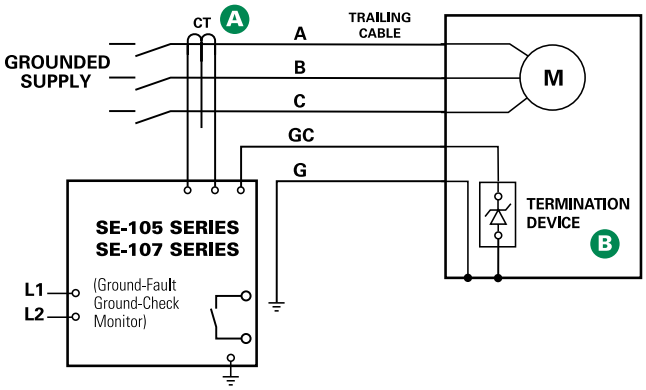
Specifications

IEEE Device Numbers	Checking or Interlocking Relay (3GC), Ground fault (50G/N, 51G/N)
Input Voltage	65–265 VAC; 85–275 VDC; 18–72 VDC
Dimensions	**H** 213mm **W** 99mm **D** 132mm
Trip Level Settings	0.5–12.5A for SE-CS10, 2–50A for SE-CS40
Trip Time Settings	0.1–2.5s
Contact Operating Mode	Selectable fail- safe or non fail safe
Harmonic Filtering	Standard feature
Test Button	Standard feature
Reset Button	Standard feature
Output Contacts	Isolated Form A and Form B, Two Form C
Approvals	CSA certified, UL Listed (E340889), C Tick (Australia)(3), CE(3)
Conformally Coated	Standard feature
Warranty	5 years
Mounting	Panel, Surface
GC Trip Resistance	28Ω (Standard), 45Ω (XGC Option)

SE-105, SE-107 Series

Trailing Cable Relay

Simplified Circuit Diagram



Ordering Information

ORDER NUMBER	POWER SUPPLY
SE-105	120 VAC
SE-105D	120 VAC/VDC
SE-105E	240 VAC
SE-107	120 VAC
SE-107D	120 VAC/VDC
SE-107E	240 VAC

ACCESSORIES	REQUIREMENT
CT200 Series PPI-600V Optional	Required
1N5339B	Included
SE-TA6, SE-TA6-SM	Optional
SE-TA6A Series	Optional
RK-102, RK-105, RK-105I	Optional
RK-13	Optional
PPI-600V	Optional

Description

The SE-105/SE-107 is a combination pilot wire monitor and earth fault relay for resistance earthed systems. It continuously monitors the integrity of the earth conductor to protect portable equipment from hazardous voltages caused by earth faults. The SE-105/SE-107 is an excellent choice for trailing cables 5kV and under in underground mining applications. For higher voltages or long-cable applications, see the SE-134C/SE-135.

Features & Benefits

FEATURES	BENEFITS
Adjustable pickup (0.5, 2.0, 4.0 A)	Unit can be used on a wide variety of trailing cable applications
Adjustable time delay (0.1–2.0 s)	Adjustable trip delay for quick protection and system coordination
Harmonic filter	Prevents false operation
Zener-characteristic termination assembly	Provides reliable ground check loop verification
Fail safe ground check circuit	Ensures ground check circuit remains safe even in the event of equipment failure
Conformal coating	Additional coating protects circuit boards against harsh environment
SE-105: Selectable UV or shunt trip mode	Provides flexibility for different applications
SE-107: UV-trip mode only	Eliminates chance of unauthorised change to trip circuit

Accessories

A

CT200 Series Current Transformer
Required CT detects ground-fault current.

B

1N5339B Termination Device
5W axial-lead ground-check termination; included with SE-105/SE-107.

SE-TA6 Termination Assembly
Optional termination assembly with convenient terminals and mounting holes

SE-TA6-SM Stud-Mount Termination Assembly
Optional 50W ground-check termination that is robust and compact for submersible pumps. Wire lead simplifies installation.

Specifications

IEEE Device Numbers	Checking or Interlocking Relay (3GC), Ground Fault (50G/N, 51G/N)
Input Voltage	See ordering information
Dimensions	**H** 150mm **W** 109mm **D** 100mm
Trip Level Settings	0.5, 2.0, 4.0A
Trip Time Settings	0.1–1.0s
Contact Operating Mode	Selectable fail-safe or non-fail-safe (SE-105) Fail-safe only (SE-107)
Harmonic Filtering	Standard feature
Test Button	Standard feature
Reset Button	Local and remote
Output Contacts	Isolated Form A
Approvals	CSA certified, UL Listed (E340889), C Tick (Australian)
Conformally Coated	Standard feature
Warranty	5 years
Mounting	Surface

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PGR-6101 Series

Ground Fault & Insulation Monitor

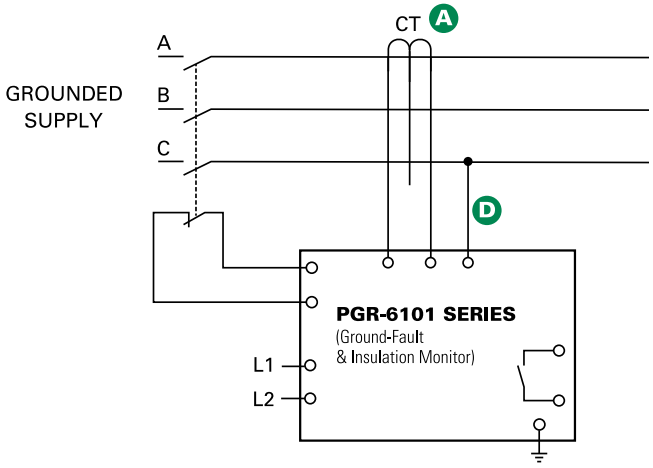
Description

The PGR-6101 combines the features of a ground fault protection relay and insulation monitor into one unit. It protects against ground faults by monitoring insulation resistance when the motor is de energised and by monitoring ground fault current when the motor is energized. The PGR-6101 features two separate analog outputs for optional current and ohm meters, and two separate alarm relays. It operates on one or three phase solidly grounded, resistance grounded and ungrounded systems up to 6kV.

Features & Benefits

FEATURES	BENEFITS
Adjustable GF pickup (30–200mA)	Trip setting provides a wide range of low level protection and system coordination
Adjustable insulation pickup (60–600 kΩ)	Customizable insulation resistance setpoints for maximum protection
Adjustable time delay (50–250ms)	Adjustable trip delay for quick protection and system coordination
Output contacts	Two Form C output contacts for ground fault and insulation resistance fault
Analog outputs (0–1 mA)	Two analog outputs indicate insulation resistance and ground fault current
CT Loop monitoring	Alarms when CT is not connected
Selectable contact operating mode	Selectable fail safe or non fail safe operating modes allows connection to shunt or undervoltage breaker coil

Simplified Circuit Diagram



Accessories

PGC-5000 Series Ground Fault Transformers
Required zero sequence current transformer specifically designed for low level detection. Flux conditioner is included to prevent saturation.

PGA-0500 Analog % Current Meter
PGA-0510 Analog Ohm Meter
Optional panel mounted meters display ground fault current as a percentage of the set point and insulation resistance.

PGH Family High Tension Couplers
Required (for systems >1,300 V) PGH Family high tension coupler must be connected between the phase conductor and the PGR-6101.

Ordering Information

ORDER NUMBER	POWER SUPPLY
PGR-6101-120	120 VAC

ACCESSORIES	REQUIREMENT
PGC-5000 Series	Required
PGH Family	Required >1300 V
PGA-0500	Optional
PGA-0510	Optional

Specifications

IEEE Device Numbers	Ground Fault (50G/N, 51G/N), Ground detector (64), Alarm Relay (74)
Input Voltage	120 VAC
Dimensions	**H** 75mm **W** 100mm **D** 115mm
Response delay	< 50ms
Contact Operating Mode	Selectable fail safe or non fail safe
Harmonic Filtering	Standard feature
Test Button	Standard feature
Reset Button	Standard feature
CT Loop Monitoring	Standard feature
Output Contacts	Two Form C
Analog Output	0–1mA
Approvals	UL Listed (E183688)
Warranty	5 years
Mounting	DIN, Surface

FUSES

PROTECTION RELAYS

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POWER FACTOR CORRECTION

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Power Factor Correction

Simple power factor correction solutions incorporate banks of capacitors that work as silent reactive power 'generators'. These systems were designed many decades ago when electrical environments were a lot simpler than they are today. They are common, very economical and suitable for linear load environments.

However, in today's modern electrical environments, linear loads are not easy to find. Due to the proliferation of LED/ energy efficient lighting, switch-mode power supplies, VSD's, UPS's, servers/computers and typical appliances, today's electrical systems experience complex, dynamic non-linear loads. Loads are being switched so fast that the traditional capacitor bank PFC systems struggle to maintain an effective compensation set-point. Therefore, they are perpetually 'chasing' the load, either under or over-compensating but rarely providing effective compensation.

- No Capacitor Banks
- Wall Mounting Solutions
- Load Balancing
- Dynamic Step-less Compensation
- Can maintain a PF of 0.99 lagging or unity if required

Sinexcel®

The Sinexcel SVG (Static Var Generator)

The Sinexcel SVG represents the latest generation technology in the power factor correction field. It operates by detecting the load current on a real-time basis through an external CT (current transformer) and determining the reactive content of the load current. The data is analysed and the SVG's controller drives the internal IGBT's by using PWM signals to make the inverter produce the exact reverse reactive current of the corresponding load reactive content which is injected into the grid.

The SVG range offers instantaneous, dynamic step-less compensation, ideal for the challenging demands of modern electrical environments. Sinexcel SVG solutions do not need an AC capacitor bank and offer many advantages due to their compact & modular configuration (including wall-mount options).

The SVG Range

Wall-Mount Solutions

50kVAr
500W x 190D x 585H (mm)
Weight: 28kg

100kVAr
500W x 286D x 557H (mm)
Weight: 44kg

200kVAr
500W x 370D x 722H (mm)
Weight: 110kg

Rack-Mount Solutions

50kVAr
500W x 600D x 190H (mm)
Weight: 28kg

100kVAr
500W x 560D x 269H (mm)
Weight: 44kg

100kVAr (PRO Series)
500W x 550D x 190H (mm)
Weight: 35kg

200kVAr
500W x 722D x 370H (mm)
Weight: 110kg

Cabinets

Up to 500kVAr
Standard Flexi-Cabinet
800W x 800D x 2200H (mm)

Up to 600kVAr
Large Flexi-Cabinet
800W x 1000D x 2200H (mm)

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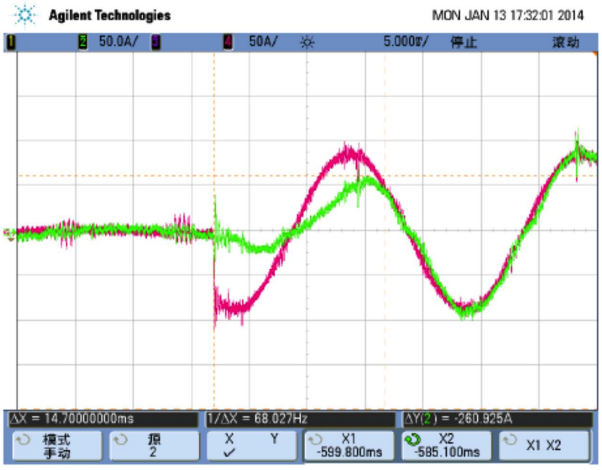
Features

Exceptional power factor correction performance

- Can maintain a Power Factor of 0.99 lagging or unity if required.

Dynamic step-less compensation

- Profiles the load and operates with a response speed of <15ms.
- Dynamic reaction time is less than 50µs. It is a virtual real-time instantaneous response.
- Only injects the kVAr that is required in that moment.
- No possibility of over-compensation or under-compensation.



The SVG recalculates the required load accurately and quickly. The IGBT technology switches with high speed, quickly matching the load requirement.

SVG Modules can be parallel connected

- Wall or rack mounted modules can be parallel connected to increase capacity in a 'Master / Master / Master' arrangement. In the event that one unit shuts down, the other units remain operational.

Corrects lagging (inductive loads) AND leading (capacitive loads)

- Power factor range (-1 to +1)

Corrects Load Imbalance

- Can balance the phase currents to further lower the peak kVA presented to the grid.

Operates in all 3 Phases

- Measures and provides dynamic kVAr compensation throughout all three phases.

Not affected by resonance & harmonics

- No AC switched capacitors to be affected by resonance & harmonics in the system.

Can work with & enhance existing capacitor bank systems

- If you already have an existing capacitor bank PFC system, you can add an SVG to improve the performance achieved.

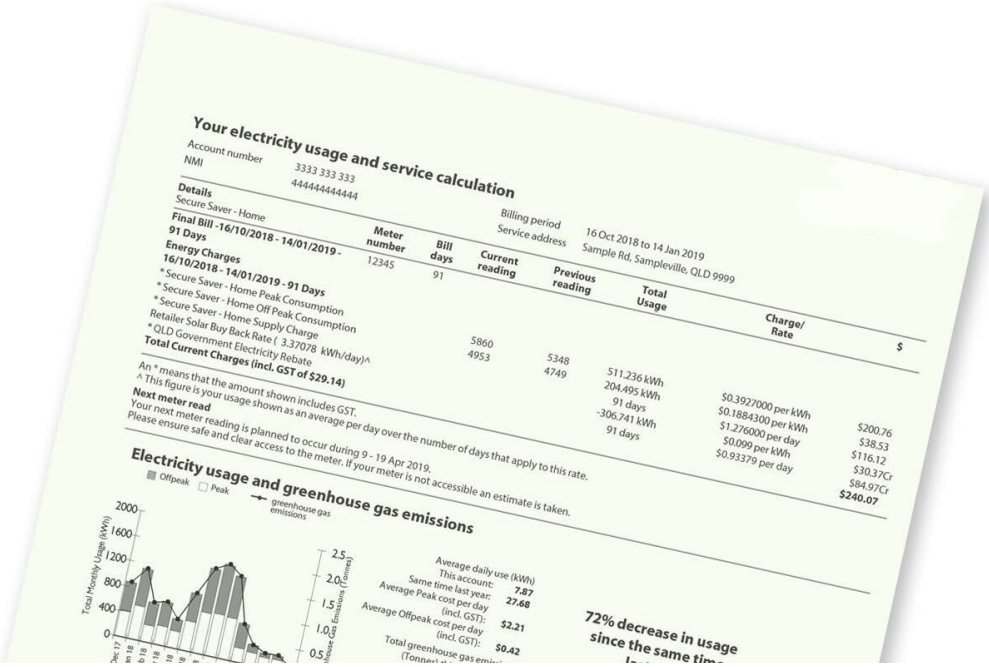
Can operate at low voltages

- Handy in regional/remote areas or challenging environments.

Benefits

Save money on electricity costs

- If your billing has changed to a kVA demand tariff and you have poor power factor, you are definitely paying for electricity that you are not using. In such cases, the SVG will reduce your electricity bills. Typically, most installations achieve savings of 10%-30%.



Your electricity usage and service calculation

Account number 3333 333 333
NMI 4444444444444

Billing period 16 Oct 2018 to 14 Jan 2019
Service address Sample Rd, Sampleville, QLD 9999

Details	Meter number	Bill days	Current reading	Previous reading	Total Usage	Charge/ Rate	$
Secure Saver - Home							
Final Bill -16/10/2018 - 14/01/2019 - 91 Days							
Energy Charges							
16/10/2018 - 14/01/2019 - 91 Days							
* Secure Saver - Home Peak Consumption	12345	91	5860	5348	511.236 kWh	$0.3927000 per kWh	$200.76
* Secure Saver - Home Off Peak Consumption			4953	4749	204.495 kWh	$0.1884300 per kWh	$38.53
* Secure Saver - Home Supply Charge					91 days	$1.276000 per day	$116.12
Retailer Solar Buy Back Rate (3.37078 kWh/day)^					-306.741 kWh	$0.099 per kWh	$30.37Cr
* QLD Government Electricity Rebate					91 days	$0.93379 per day	$84.97Cr
Total Current Charges (incl. GST of $29.14)							**$240.07**

An * means that the amount shown includes GST.
^ This figure is your usage shown as an average per day over the number of days that apply to this rate.
Next meter read
Your next meter reading is planned to occur during 9 - 19 Apr 2019.
Please ensure safe and clear access to the meter. If your meter is not accessible an estimate is taken.

Electricity usage and greenhouse gas emissions

Offpeak Peak greenhouse gas emissions

Total Monthly Usage (kWh) 2000 1600 1200 800 400 0
Greenhouse Emissions (Tonnes) 2.5 2.0 1.5 1.0 0.5

Average daily use (kWh)
This account: 7.87
Same time last year: 27.68
Average Peak cost per day (incl. GST): $2.21
Average Offpeak cost per day (incl. GST): $0.42
Total greenhouse gas emi

72% decrease in usage since the same tim

Virtually no on-going maintenance costs

- No maintenance costs required, no on-going servicing or spare parts required.

Eliminating the weakest link – the capacitors

- The most vulnerable and weakest link in a traditional PFC system are the switched capacitors. Capacitors can leak, rupture or ignite & have life expectancy of 3-7 years, depending on environmental conditions, resulting in high maintenance costs. The SVG eliminates the need for AC capacitors, resulting in greater longevity and minimal maintenance costs.

ROI (Return on Investment)

- It makes great financial sense to invest in SVG technology. Typically, our customers achieve a ROI of 18 months – 3 years. After this period, they benefit from on-going cheaper electricity costs permanently.

The SVG does not require a maintenance contract

- Because there are no capacitors to maintain, the on-going costs are negligible.

Reduced burden on infrastructure

- The SVG reduces heat on the electrical system, resulting in greater longevity and lower maintenance costs.

Greater longevity

- With traditional capacitor-based systems, when smaller steps are needed for fine adjustment, the space required for either 6.25kVAr or 50kVAr steps is the same. Small steps for fine adjustment also result in the system getting frequently switched, over-used & worn out. The SVG does not suffer from this problem.

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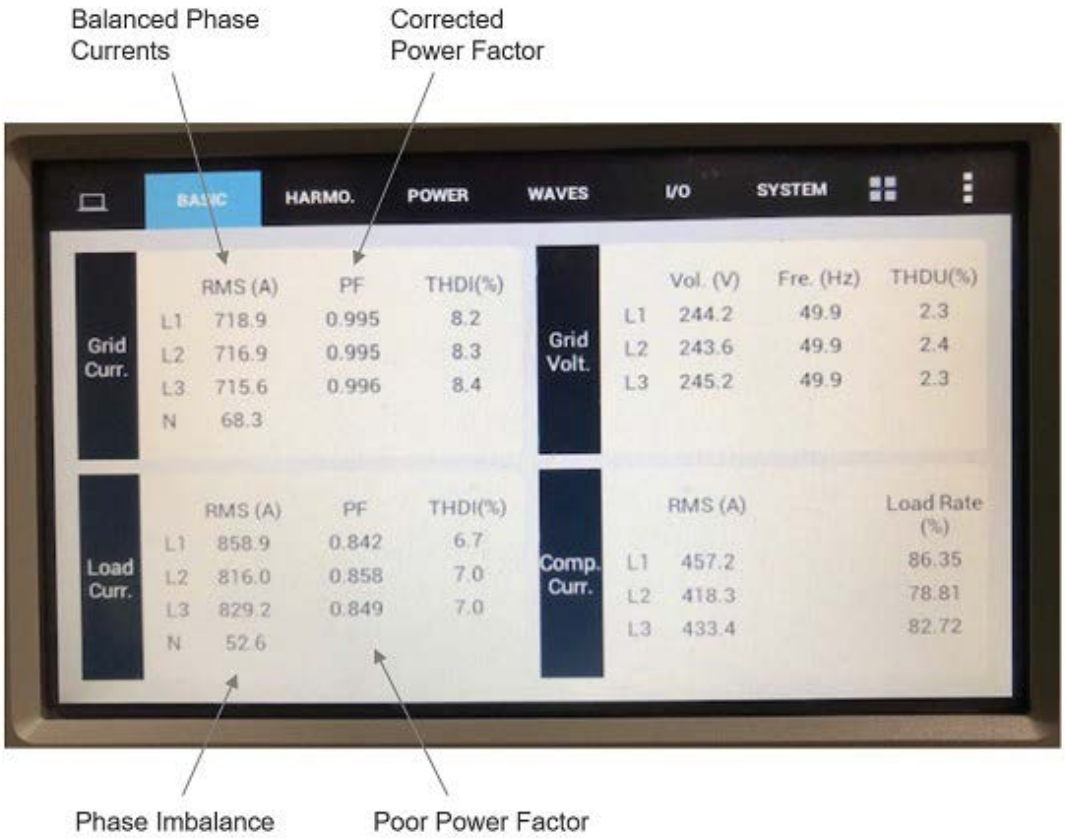
The SVG in action



This screen shot is from a Sinexcel SVG unit operating at one of our customer locations.

- The Load Current information in the bottom left of the screen displays the actual load, RMS (Amps) of the site, the PF (Power Factor) and the THDI (Total Harmonic Distortion Current).
- There are 2 important factors to note here. Firstly, this site has a significant phase current imbalance. The RMS between the 3 phases ranges from 858.9A to 816A. That is a 42.9A phase current imbalance. Secondly, the PF ranges from 0.842-0.858 across the three phases which is considered poor and correction is required.
- The Grid Current information at the top left of the screen displays the corrected RMS and PF after compensation by the Sinexcel SVG. Note that the phase current imbalance has been corrected and the RMS has been reduced to 442A (approx. 17% reduction). The PF has been corrected to 0.995. This sort of performance cannot be achieved with traditional PFC systems.
- By correcting the power factor and the phase imbalance, the Sinexcel SVG presented an almost perfect load to the grid, resulting in a maximum return available when a kVA peak demand tariff is used, which significantly reduced their energy costs.

Unprecedented Performance

- Up to 200kVAr capability from a single wall-mounted module – can be parallel connected for unlimited capacity.
- Up to 200kVAr capability from a single rack-mounted module.
- Up to 600kVAr capability from a single cabinet solution.

Sinexcel SVG vs Switched Capacitor Bank Systems

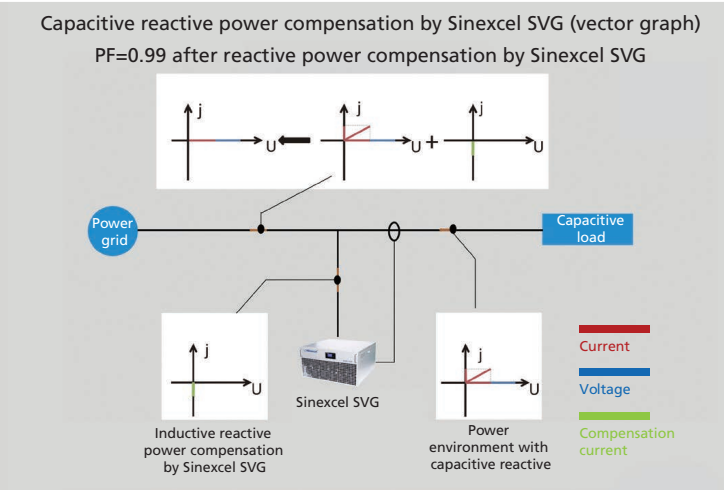
When to use the Sinexcel SVG:

- Ideal for fast switching load environments (switched capacitor bank system can't keep up).
- Environments with space restrictions. Wall mounting solutions save valuable floor space -single modules are available up to 200kVAr and can be parallel connected. Single cabinet solutions up to 600kVAr are available.
- Electrical systems with leading power factor loads (eg. data centres).
- Unbalanced load environments. SVG's correct load imbalances.
- Low voltage environments (eg. country or remote areas, mining locations).
- Harmonically rich environments, possibly with resonance issues (eg. VSD's, LED lighting, data centres).

When to use a Switched Capacitor Bank System:

- Electrical environments with stable linear loads. (eg. Direct-on-line electric motors).

Performance	Sinexcel SVG (Static VAr Generator)	Switched Capacitor Bank System
Mode of Operation	The SVG detects the load current on a real-time basis through an external CT and determines the reactive content of the load current. The data is analysed and the SVG's controller drives the internal IGBT's by using PWM signals to make the inverter produce the exact reverse reactive current of the corresponding load reactive current.	The system detects the load current on a real-time basis through an external CT and determines the reactive content of the load current. The data is analysed and the system's controller switches in the required amount of reactive current in steps, depending on the amount of reactive current available to it in that moment from the capacitor bank.
Compensation method	The SVG performs as a controlled current source, thus obtaining a power factor of 0.99 lagging or unity.	Traditional PFC systems use capacitors in groups. Their output current is in fixed steps (50kVAr, 25kVAr, 12.5kVAr, 6.25kVAr).
Response Time	Profiles the load and operates with a response speed of <15ms. Dynamic reaction time is less than 50us. It is a virtual real-time instantaneous response. Only injects the kVAr that is required in that moment, thus avoiding over-compensation and under-compensation.	Take 20ms-40s to respond to a change in load. Their delay combined with the stepped response performance means that they are perpetually over or under compensating.



Performance	Sinexcel SVG (Static VAr Generator)	Switched Capacitor Bank System
On-going costs	The SVG does not require a maintenance contract. It simply requires that the unit is kept clean. Aside from the initial purchase cost, on-going costs are negligible.	Capacitor bank style PFC systems are typically sold with a maintenance contract which is an on-going monthly charge to pay for regular maintenance and the cost of replacement parts like the capacitors, contactors, fuses, etc.
3 Phase Operation	The Sinexcel SVG measures and provides dynamic kVAr compensation individually in all three phases.	A switched capacitor bank style PFC system measures only one phase and provides stepped kVAr compensation to suit that phase, irrespective of what the other two phases need.
Load Imbalances	The Sinexcel SVG can, if required, balance the phase currents to further lower the peak kVA presented to the grid (or energy authority).	Capacitor banks with Delta connected capacitors cannot balance the load currents in a 3 phase system.
Wall-Mount Solutions	The Sinexcel SVG is available in the following wall-mount options: 50kVAr, 100kVAr & 200kVAr.They can be parallel connected in a 'Master / Master / Master' type arrangement. This 'plug and play' system provides the safest continuous operation. If one unit is shut down for whatever reason the remaining modules remain in operation until the alarm is attended to or the situation resolved.	Limited Range
Resonance	The capacitance of the SVG does not require the installation of a de-tuning reactor. Performing as a current source and an active compensation device the SVG has been designed to not be affected by resonance.	Traditional PFC systems are affected by resonance, which is detrimental to the capacitors. To lower the risk, de-tuning reactors are introduced into the circuit to lower the resonant frequency below that of the lowest harmonic in the circuit.
Harmonics	The Sinexcel SVG can operate in harmonically rich environments of up to 15% THDV without detriment to itself or its performance.	Even with the use of de-tuned reactors, harmonics play a major role in shortening the lifespan of capacitors and contributing to their destruction.
Load Type	The SVG can correct both a lagging and a leading power factor, as well as work with a traditional capacitor type PFC system to eliminate over and under compensation.	Capacitor bank style PFC systems can only compensate for inductive loads.
Operation at low voltages	Designed with an active compensation circuit. Therefore the voltage of the grid has little influence on the compensation capacity. The output of reactive current matches the working conditions even when the voltage of the power grid is low.	Capacitor output is subject to the voltage of the grid, so if the grid voltage is low the output of the capacitors will be low, resulting in a decline in available compensating capacity, under-compensation and possible fault conditions.
Sizing	The compensation capacity of the SVG is the same as the installed capacity. Therefore for a given compensation effect, the capacity of the SVG may be 20%-30% less than that of a standard capacitor type PFC system.	To better suit the changing dynamics of the load, a traditional capacitor type PFC system needs to be oversized and to have a greater number of smaller steps to better suit the application. This increases the cost.
ROI (Return on Investment)	The SVG does not require a maintenance contract. It simply requires that the unit is kept clean. Aside from the initial purchase cost, on-going costs are negligible.	When estimating the ROI for capacitor bank style PFC systems, apart from the initial cost of the system, other factors over the medium to long term must be considered, including the on-going cost of the maintenance contract and replacement parts like the capacitors, contactors, fuses, etc.

FUSES

PROTECTION RELAYS

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POWER QUALITY

Power Quality. Done Right.

Power Quality

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Active Harmonic Filters

146

Sinexcel Active Harmonic Filters (AHF)

THDi < 5%

Wall Mounted Solutions

Modular

Load balancing and reactive power (PFC)

Up to 900A from a single cabinet solution

Meets AS/NZS 61000.3.6 standards and IEEE519 recommendations

Passive Harmonic Filters

154

MTE Matrix AP Passive Filters

5% THDi performance

Adaptive passive technology

Reduces energy costs

Better power factor

Compatibility with generators

Meets IEEE-519 requirements for harmonic current

Line & Load Reactors

158

MTE RL Reactors

Applied to the load side and line side of a VSD

Reduces harmonic distortion

Reduces surge currents

Eliminates nuisance tripping

Improves power factor

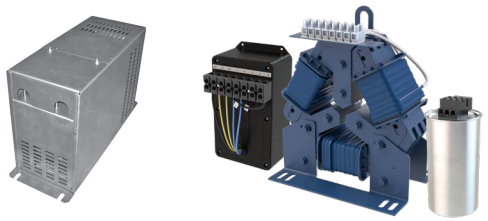
Extends lifespan of VSD rectifier

Motor Protection

160

Sine Wave Filters

- Increases motor life
- Allows for the use of longer motor cables
- Reduces motor audible noise, vibration and heat
- Reduces radiated emissions
- Protects your motor cable
- Reduction of bearing currents



dV/dT Filters

Provides >50% common mode reduction, peak voltage protection, and rise time reduction - all in one filter.

- Protects motors from long lead peak voltages
- Prevents voltage spikes from exceeding 1kV
- Increases motor bearing life and up-time

Voltage Regulators

164

Wide Range of Voltage Regulators

- Indoor and outdoor solutions available
- Wide input range (184-287V for 230V)
- Precise regulation (±3%)
- Features complete line conditioning
- 96-98% efficiency
- Single & Three phase available
- 3kVA to 4,000kVA

RFI/EMI Filters

166

Schaffner RFI Filters

- Single Phase & 3 phase available
- Blocks radio frequencies that cause electrical interference
- Reduces inverter instability
- Reduces control systems interference

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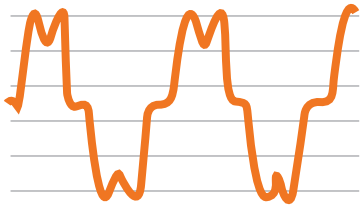
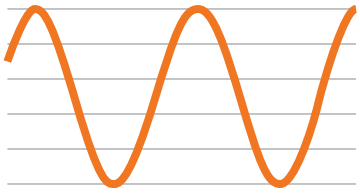
Power Quality

The term 'Power Quality' is used to describe the quality or 'fitness' of electric power that drives an electrical load and the load's ability to function properly. Without the proper power, an electrical device may malfunction, fail prematurely or not operate at all.



DIRTY POWER



CLEAN POWER

The term 'clean power' is used to describe electricity that is considered to be of good quality (see below) with particular reference to a very low harmonic content. Therefore, the term 'dirty power' is used to describe electricity that is considered to be of low quality (opposite to the above) with particular reference to a very high harmonic content.

Fuseco is committed to providing power quality solutions that represent great value. Current generation technology applied with a practical, proven approach that represents a sensible value for money outcome.

The following list of characteristics are considered to be necessary for 'good power quality'.

1. It must have a continuity of service (not be interrupted).

Contact Fuseco to discuss solutions that are often used to provide continuity of supply in the event of 'power outages'.

2. It must have a very low harmonic content.

Harmonics can be created by non-linear loads such as variable speed drives, lighting and computer servers / data centers. Refer to pages 146-163 for information on harmonic mitigation solutions.

3. It must have a very low variation in the voltage magnitude.

Voltage regulators are often used to provide a stable voltage supply in challenging electrical environments. Refer to pages 164-165 for more information.

4. It must have very low transient voltages and currents.

In most cases, these phenomena are a by-product of the system load, especially environments with mechanical or high speed switching. Active Harmonic Filters (refer pages 146-151) and SVG units (refer pages w127-134) can provide improvements this area.

If we look beyond the power quality of the supply, there are also considerations regarding the power quality of a particular localised electrical environment. The power supply may be of good quality, however if the loads in a particular system are challenging (eg. non-linear, mechanical & high speed switching environments), the resulting power quality of that system may be poor.

In these cases, Active Harmonic Filters on pages 146-151 can be employed within a customised solution to improve the quality and efficiency of that particular electrical environment. Contact Fuseco for specific solutions to challenging electrical environments.

Power Quality – Applications

Solar Inverters can create RFI. RFI filters can be installed to eliminate or reduce the issues.

Hydraulic Systems Hydraulic Systems that manage the movement of water (eg, bathrooms, kitchens, waste and irrigation) incorporate pumps, motors and VSDs that propagate harmonics.

Lighting Systems can create RFI and harmonics due to operational high frequency switching.

HVAC Systems that manage heating, air ventilation and air conditioning incorporate pumps, motors and VSDs, resulting in the propagation of harmonics.

Vertical Transport Systems such as elevators, lifts and escalators incorporate VSDs, resulting in the propagation of harmonics.

The Distribution Boards on each floor are a location where harmonic mitigation devices are often installed to reduce the system harmonic content.

The Main Switchboard is the location where Power Factor Correction Solutions are installed to bring the system power factor to unity and Active Harmonic Filters are installed to mitigate harmonics to comply with IEEE519-1992 and AS/NZS 61000.3.6

Data Centers & Computer Server Rooms utilise systems that can create harmonics and a leading power factor.

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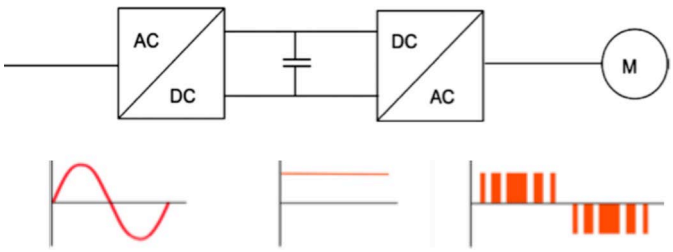
VSDs and Harmonics

For motors to be used in a practical and useful way, we need to be able to control their speed of operation. A Variable Speed Drive (VSD), also known as a Variable Frequency Drive (VFD) is a programmable device that controls motor speed.

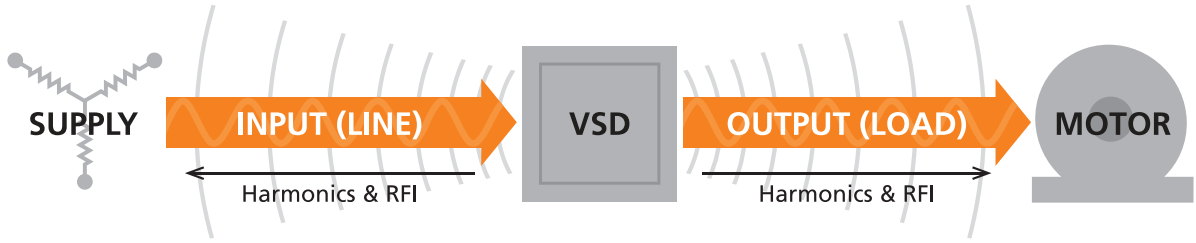
A VSD works by having a rectifier section at the input and this creates DC voltage on the DC bus (needed for switching). The inverter section at the output side provides the Pulse Width Modulation (PWM) waveform. A drive changes the speed of the motor by changing the frequency to the motor. As an aside, the impedance of the motor is determined by the inductive reactance in the windings, and it changes as the frequency changes.

Rectifier DC Bus Inverter IGBT



PWM is employed to control the voltage and frequency to the motor drive. DC voltage is applied to the motor by controlled pulses at high frequency, which results in voltage that approximates a sine wave of the chosen frequency.

This PWM method creates harmonics in the system. The switching also creates radio frequency interference (RFI) and voltage spikes that can be up to 1200V at the motor terminals. The high switching frequency can also lead to 'capacitive bearing currents' that flow through the motor bearings and can damage the bearing surfaces. A portion of the harmonics are reflected back to the VSD by the motor, creating further issues in the electrical environment.



The presence of harmonics in an electrical system can result in:

- Degradation of motors, especially the bearings and insulation = higher costs.
- Significant reduction of the lifespan of equipment due to excessive heat = higher costs.
- Although you will get billed for the power that you are supplied, a large percentage of that power may be unusable = higher costs.
- Unusual events such as flickering lights, alarms going off, or MCB's, MCCB's, RCD's and Earth Leakage devices tripping for no apparent reason = more down time = higher costs.

VSDs are prolific creators of harmonics in electrical systems and as a result, most of the harmonic mitigation effort focuses on the input side and output side of a VSD. For the mitigation of harmonics on the input side (line side) of a VSD we recommend Line Reactors, Passive Harmonic Filters and Active Harmonic Filters. For the mitigation of harmonics on the output side (load side) of a VSD we recommend Load Reactors, dV/dT Filters and Sine Wave Filters.

Sellers of VSDs please note:

- Customers are becoming more aware of the damage caused by VSD related harmonics. Harmonic mitigation products are now being offered to customers as a 'value-add', in essence as an 'insurance policy' against the detrimental effects of harmonically rich environments, enhancing the longevity of both the motors and the drives.
- These products are also used on the input side of a drive in situations where harmonics are causing issues and in cases where a site needs to comply to supply authority requirements for harmonic content coming back onto the grid.
- Harmonic mitigation products MUST be considered for applications with long cable runs and/or multiple VSDs in the one environment.

Harmonic Mitigation Solutions

SUPPLY

INPUT (LINE)

Active Harmonic Filters

- Reduces harmonics to 5% or less
- Simultaneous compensation of 2nd to 50th harmonic order
- Provides leading & lagging power factor correction
- Load balancing
- Reduces supply sags & surges
- Meets AS/NZS 61000.3.6 standards and IEEE519 recommendations

Passive Harmonic Filters (Low Pass Filters)

- Reduces harmonics to 5%
- Reduces cable heating & energy losses
- Improves power factor and reduces system losses
- Minimises interference with other equipment
- Easy installation and operation
- Meets AS/NZS 61000.3.6 standards and IEEE519 recommendations

Line Reactors (Chokes, Inductors, Line Filters)

- Reduces harmonic distortion
- Reduces surge currents
- Virtually eliminates nuisance tripping
- Improves power factor
- Extends lifespan of semiconductors
- Meets AS/NZS 61000.3.6 standards and IEEE519 recommendations

RFI Filters

- Blocks radio frequencies that cause electrical interference
- Reduces inverter instability
- Improves radio & TV reception
- Reduces control systems interference

VSD

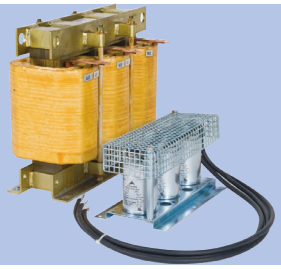
OUTPUT (LOAD)

Load Reactors (Motor Chokes, Inductors, Load Filters)

- Reduces harmonic distortion
- Reduces surge currents
- Protects motors from long lead effects
- Reduces reflective currents
- Reduces motor temperatures & audible noise
- Meets AS/NZS 61000.3.6 standards and IEEE519 recommendations

dV/dT Filters

- Protects motors from long lead peak voltages
- Prevents voltage spikes from exceeding 1kV
- Increases motor bearing life & up-time
- Reduces common mode noise and currents
- Reduction of motor temperatures & peak voltages
- Meets AS/NZS 61000.3.6 standards and IEEE519 recommendations



Sine Wave Filters

- Allows for the use of unshielded cables (lower project costs)
- Allows for the use of longer motor cables
- Reduces eddy currents, stray flux losses & bearing currents
- Eliminates torque ripple & voltage wave reflection
- Reduces motor noise, vibration & heat
- Meets AS/NZS 61000.3.6 standards and IEEE519 recommendations

MOTOR

Power Quality Standards

Australian Standards

The relevant standard for harmonic voltage distortion in Australia is AS/NZS 61000.3.6 and it is compatible with the IEEE 519 recommendations. If the supply authority is dissatisfied with the degree of voltage distortion at the point of common coupling (PCC), harmonic filtering may be specified to comply with the Australian Standards.

Odd harmonics, non-multiples of 3		Odd harmonics, multiples of 3 (triplens)		Even harmonics	
Order, h	% harmonic voltage	Order, h	% harmonic voltage	Order, h	% harmonic voltage
5	5	3	5	2	2
7	5	9	1.5	4	1
11	3.5	15	0.3	6	0.5
13	3	21	0.2	8	0.5
17	2	>21	0.2	10	0.5
19	1.5			12	0.2
23	1.5			>12	0.2
25	1.5				
>25	0.2 + 1.1(25/h)				

NOTE: total harmonic distortion (TDHV) 8% max

IEEE 519

The IEEE is the Institute of Electrical and Electronics Engineers. IEEE 519 'Recommended Practices and Requirements for Harmonic Control in Electric Power Systems', was published in 1981. The document established the levels of voltage distortion that are acceptable to a distribution system and has been widely applied in establishing required harmonic correction throughout the electrical industry.

The new IEEE 519, published in 1992, sets forth limits for both harmonic voltages on the utility transmission and distribution systems and harmonic currents within the industrial distribution systems. Since harmonic voltages are generated by the passage of harmonic currents through distribution system impedances, by controlling the currents or system impedances within the industrial facility, one can control harmonic voltages on the utility distribution.

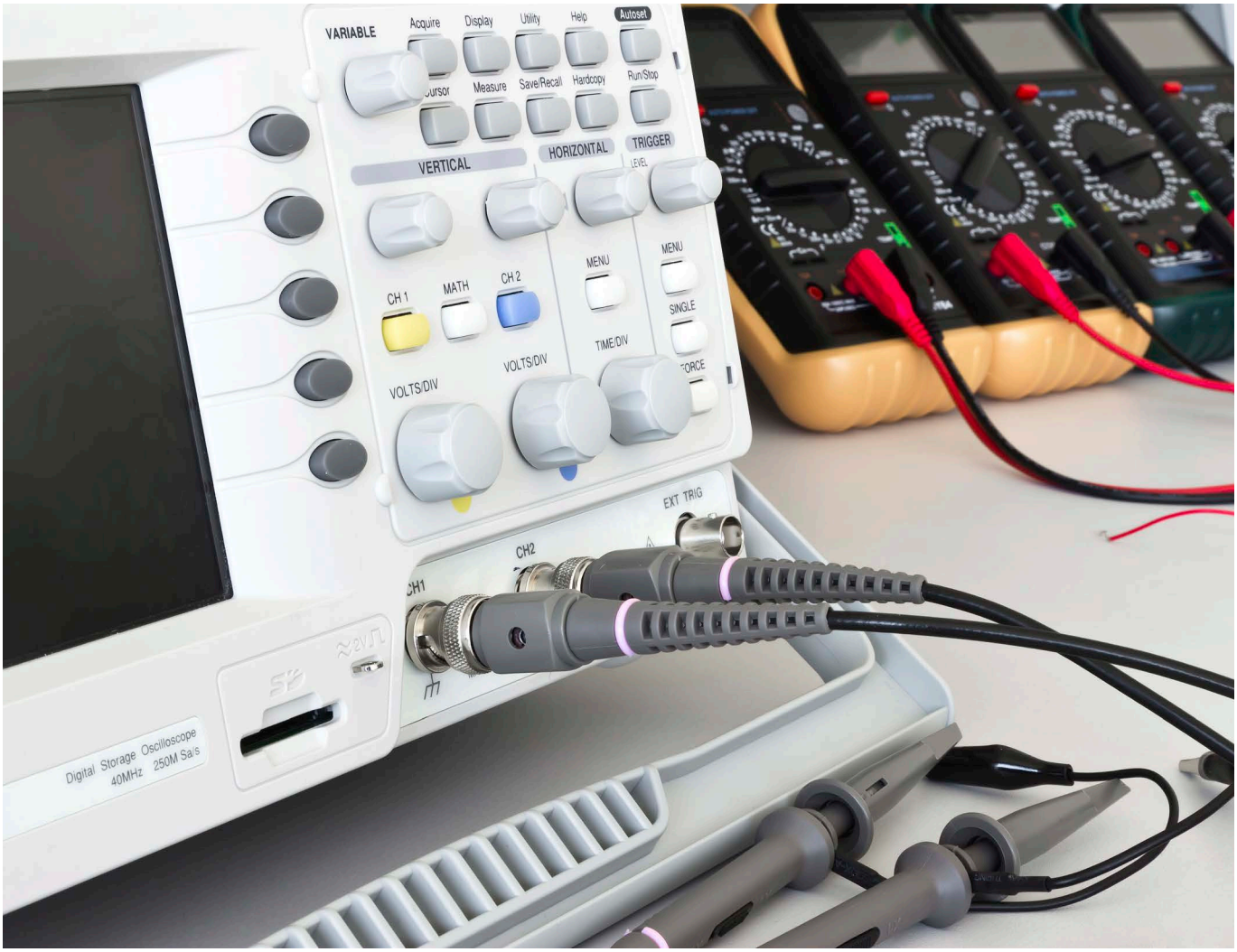
IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

Table 10-3 of IEEE Std 519-1992

ISC/IL	<11	11≤h<17	17≤h<23	23≤h<35	35≤h	Total Demand Distortion
<20*	4.0	2.0	1.5	0.6	0.3	5.0
20<50	7.0	3.5	2.5	1.0	0.5	8.0
50<100	10.0	4.5	4.0	1.5	0.7	12.0
100<1000	12.0	5.5	5.0	2.0	1.0	15.0
>1000	15.0	7.0	6.0	2.5	1.4	20.0

Note:
- Current Distortion Limits for General Distribution Systems (120V through 69,000V)
- Maximum Harmonic Current Distortion in Percent of I L • Individual Harmonic Order (Odd Harmonics)
- Even harmonics are limited to 25% of the odd harmonic limits above
- Current distortions that result in a DC offset, e.g. half-wave converters, are not allowed
- All power generation equipment is limited to these values of current distortion, regardless of actual ISC/IL (ISC = maximum short-circuit current at PCC; IL = maximum demand load current, fundamental frequency component, at PCC)

Site Audit



A Power Quality Site Audit is a service offered by Fuseco to our customers and the industry. A power quality consultant visits your site and conducts a power quality audit of your electrical system.

This involves setting up sophisticated measuring equipment on site that monitors and records all of the electrical activity that is occurring within the system over a period of time. The equipment is compact, easily transportable to most locations and can be set up indoors or outdoors.

An analysis of the recorded data usually helps to reveal any harmful harmonics, voltage supply and power factor issues. Our consultant will consider the data and present you with a power quality report, outlining the observed issues and suggesting solutions if required.

Audits are useful in determining electricity usage inefficiencies and identifying damaging harmonics which occur in electrical systems.

Even correctly functioning power systems require routine auditing to ensure early identification of any potential issues and proactive servicing requirements to keep power equipment operating to its full potential and the electrical environment complying to the Australian Standard AS/NZS 61000.3.6 and compatible with the IEEE519 recommendations.

A correctly functioning system could save you upwards of 30% off your power bills. In some industries and installations, that could translate to significant increases to your bottom line. By running an efficient system, you also use less energy and therefore help the environment.

To discuss our site analysis service in more detail, please contact a power quality consultant at Fuseco.

FUSECO

Selection Guide

		3% IMPEDANCE Reactors				5% IMPEDANCE Reactors				RFI FILTERS	
VOLTAGE		**415V**	**415V**	**415V**	**415V**	**415V**	**415V**	**415V**	**415V**	**415V**	**415V**
BRAND		**MTE**	**MTE**	**TCI**	**TCI**	**MTE**	**MTE**	**TCI**	**TCI**	**SCHAFFNER**	**SCHAFFNER**
kW	**AMPS**	IP00 (open)	Nema 1 IP20	Open Panel	IP20 (enclosed) Nema 1, 2	IP00 (open)	IP20 (enclosed) Nema 1, 2	Open Panel	IP20 (enclosed) Nema 1, 2	Low Leakage	Ultra Low Leakage (Data centre compatable)
0.18	0.4	RL-00103	RL-00113	KDRA6L	KDRA6LC1	RL-00102	RL-00112	KDRA6H	KDRA6HC1	FN3287-10-44-C26	FN3288-10-44-C21
0.25	0.6	RL-00103	RL-00113	KDRA6L	KDRA6LC1	RL-00102	RL-00112	KDRA6H	KDRA6HC1	FN3287-10-44-C26	FN3288-10-44-C21
0.37	0.9	RL-00202	RL-00212	KDRA7L	KDRA7LC1	RL-00203	RL-00213	KDRA6H	KDRA6HC1	FN3287-10-44-C26	FN3288-10-44-C21
0.55	1.3	RL-00202	RL-00212	KDRA7L	KDRA7LC1	RL-00203	RL-00213	KDRA8H	KDRA8HC1	FN3287-10-44-C26	FN3288-10-44-C21
0.75	1.8	RL-00201	RL-00211	KDRA8L	KDRA8LC1	RL-00202	RL-00212	KDRA8H	KDRA8HC1	FN3287-10-44-C26	FN3288-10-44-C21
1.1	2.6	RL-00403	RL-00413	KDRA9L	KDRA9LC1	RL-00404	RL-00414	KDRA9H	KDRA9HC1	FN3287-10-44-C26	FN3288-10-44-C21
1.5	3.5	RL-00402	RL-00412	KDRA1L	KDRA1LC1	RL-00404	RL-00414	KDRA1H	KDRA1HC1	FN3287-10-44-C26	FN3288-10-44-C21
2.2	4	RL-00803	RL-00813	KDRA2L	KDRA2LC1	RL-00804	RL-00814	KDRA2H	KDRA2HC1	FN3287-10-44-C26	FN3288-10-44-C21
3	6	RL-00803	RL-00813	KDRA3L	KDRA3LC1	RL-00804	RL-00814	KDRA3H	KDRA3HC1	FN3287-10-44-C26	FN3288-10-44-C21
4	7	RL-01202	RL-01212	KDRA4L	KDRA4LC1	RL-01203	RL-01213	KDRA3H	KDRA3HC1	FN3287-10-44-C26	FN3288-10-44-C21
5.5	10	RL-01202	RL-01212	KDRA5L	KDRA5LC1	RL-01203	RL-01213	KDRA4H	KDRA4HC1	FN3287-10-44-C26	FN3288-10-44-C21
7.5	14	RL-01802	RL-01812	KDRA5L	KDRA5LC1	RL-01803	RL-01813	KDRA5H	KDRA5HC1	FN3287-16-44-C26	FN3288-16-44-C21
11	20	RL-02502	RL-02512	KDRB2L	KDRB2LC1	RL-02503	RL-02513	KDRB2H	KDRB2HC1	FN3287-20-33-C26	FN3288-20-33-C21
15	27	RL-03502	RL-03512	KDRB1L	KDRB1LC2	RL-03503	RL-03513	KDRC3H	KDRC3HC2	FN3287-40-33-C26	FN3288-40-33-C21
18.5	33	RL-04502	RL-04512	KDRD1L	KDRD1LC2	RL-04503	RL-04513	KDRC1H	KDRC1HC2	FN3287-40-33-C26	FN3288-40-33-C21
22	40	RL-04502	RL-04512	KDRD2L	KDRD2LC2	RL-04503	RL-04513	KDRE2H	KDRE2HC3	FN3287-40-33-C26	FN3288-40-33-C21
30	55	RL-05502	RL-05512	KDRF2L	KDRF2LC2	RL-05503	RL-05513	KDRF4H	KDRF4HC3	FN3287-63-53-C26	FN3288-63-53-C21
37	66	RL-08002	RL-08012	KDRF4L	KDRF4LC3	RL-08003	RL-08013	KDRF1H	KDRF1HC3	FN3287-80-34-C26	FN3288-80-34-C21
45	80	RL-10002	RL-10012	KDRF3L	KDRF3LC4	RL-10003	RL-10013	KDRF2H	KDRF2HC4	FN3287-80-34-C26	FN3288-80-34-C21
55	97	RL-13002	RL-13012	KDRF3L	KDRF3LC4	RL-13003	RL-13013	KDRH2H	KDRH2HC4	FN3287-100-35-C26	FN3288-100-35-C21
75	130	RL-16002	RL-16012	KDRH3L	KDRH3LC4	RL-16003	RL-16013	KDRI2H	KDRI2HC4	FN3287-160-40-C26	FN3288-160-40-C21
90	160	RL-20002B14	RL-20012B14	KDRH2L	KDRH2LC4	RL-20003B14	RL-20013B14	KDRG3H	KDRG3HC4	FN3287-160-40-C26	FN3288-160-40-C21
110	195	RL-25002B14	RL-25012B14	KDRG3L	KDRG3LC4	RL-25003B14	RL-25013B14	KDRJ1H	KDRJ1HC5	FN3359-250-28	–
132	230	RL-32002B14	RL-32012B14	KDRG3L	KDRG3LC4	RL-32003B14	RL-32013B14	KDRJ1H	KDRJ1HC5	FN3359-250-28	–
160	280	RL-32002B14	RL-32012B14	KDRG1L	KDRG1LC4	RL-32003B14	RL-32013B14	KDRL1H	KDRL1HC5	FN3359-320-99	–
200	350	RL-40002B14	RL-40012B14	KDRG2L	KDRG2LC5	RL-40003B14	RL-40013B14	KDRL2H	KDRL2HC5	FN3359-400-99	–
250	440	RL-50002	RL-50012	KDRJ1L	KDRJ1LC5	RL-50003	RL-50013	KDRL4H	KDRL4HC5	FN3359-600-99	–
280	490	RL-50002	RL-50012	KDRL1L	KDRL1LC5	RL-50003	RL-50013	KDRL5H	KDRL5HC5	FN3359-600-99	–
315	550	RL-60002	RL-60012	KDRL2L	KDRL2LC5	RL-60003	RL-60013	KDRL6H	KDRL6HC5	FN3359-600-99	–
335	590	RL-60002	RL-60012	KDRL2L	KDRL2LC5	RL-60003	RL-60013	KDRL6H	KDRL6HC5	FN3359-600-99	–
355	620	RL-75002	RL-75012	KDRL3L	KDRL3LC5	RL-75003	RL-75013	KDRS1H	KDRS1HC5	FN3359-800-99	–
400	700	RL-75002	RL-75012	KDRL3L	KDRL3LC5	RL-75003	RL-75013	KDRS1H	KDRS1HC5	FN3359-800-99	–
450	790	RL-90002B14	RL-90012B14	KDRS1L	KDRS1LC7	RL-90003B14	RL-90013B14	KDRS2H	KDRS2HC5	FN3359-800-99	–
500	880	RL-100002B14	RL-100012B14	KDRX2L	KDRX2LC7	RL-100003B14	RL-100013B14	KDRX2H	KDRX2HC7	FN3359-1000-99	–
560	980	RL-100002B14	RL-100012B14	KDRX3L	KDRX3LC7	RL-100003B14	RL-100013B14	KDRX3H	KDRX3HC7	FN3359-1000-99	–
630	1100	RL-120002B14	RL-120012B14	KDRX1L	KDRX1LC7	RL-120003B14	RL-120013B14	KDRX4H	KDRX4HC7	FN3359-1600-99	–
670	1170	RL-120002B14	RL-120012B14	KDRX1L	KDRX1LC7	RL-120003B14	RL-120013B14	KDRX4H	KDRX4HC7	FN3359-1600-99	–
710	1240	RL-140002	RL-140012	KDRY1L	KDRY1LC7	RL-140003	RL-140013	KDRY2H	KDRY2HC7	FN3359-1600-99	–
800	1400	RL-150002	RL-150012	KDRY2L	KDRY2LC7	RL-150003	RL-150013	KDRY1H	KDRY1HC7	FN3359-1600-99	–
1000	1740	Special	Special	Special	Special	Special	Special	Special	Special	FN3359-2500-99	–
1200	2100	Special	Special	Special	Special	Special	Special	Special	Special	FN3359-2500-99	–
1320	2500	–	–	–	–	–	–	–	–	FN3359-2500-99	–

Selection Guide

		dV/dT FILTERS				SINE WAVE FILTERS				PASSIVE FILTERS		
VOLTAGE		**600V**	**600V**	**600V**	**600V**	**500V**	**500V**	**480V**	**480V**	**415V**	**415V**	**415V**
BRAND		**MTE**	**MTE**	**TCI**	**TCI**	**SCHAFFNER**	**SCHAFFNER**	**MTE**	**MTE**	**MTE**	**MTE**	**TCI**
kW	**AMPS**	IP00 (open)	IP20 (enclosed) Nema 1, 2	Open Panel	IP20 (enclosed) Nema 1, 2	IP00 (open)	IP20 (enclosed)	IP00 (open)	IP20 (enclosed)	IP00 (open)	IP20 (enclosed)	IP54
0.18	0.4	–	–	–	–	–	–	–	–	–	–	–
0.25	0.6	–	–	–	–	–	–	–	–	–	–	–
0.37	0.9	–	–	V1K2A00	V1K2A01	FN5040-4.5-82	FN5045-4.5-44	–	–	–	–	–
0.55	1.3	DVSP0003E	DVSG0003E	V1K2A00	V1K2A01	FN5040-4.5-82	FN5045-4.5-44	SWNM0002D	SWNG0002D	–	–	–
0.75	1.8	DVSP0003E	DVSG0003E	V1K2A00	VIK2A01	FN5040-4.5-82	FN5045-4.5-44	SWNM0003D	SWNG0003D	–	–	–
1.1	2.6	DVSP0003E	DVSG0003E	V1K3A00	V1K3A01	FN5040-4.5-82	FN5045-4.5-44	SWNM0003D	SWNG0003D	–	–	–
1.5	3.5	DVSP0004E	DVSG0004E	VIK4A00	V1K4A01	FN5040-4.5-82	FN5045-4.5-44	SWNM0005D	SWNG0005D	MAPP0006C	MAPG0006C	–
2.2	4	DVSP0004E	DVSG0004E	V1K4A00	V1K4A01	FN5040-4.5-82	FN5045-4.5-44	SWNM0005D	SWNG0005D	MAPP0006C	MAPG0006C	–
3	6	DVSP0007E	DVSG0007E	V1K6A00	V1K6A01	FN5040-8-82	FN5045-8-44	SWNM0012D	SWNG0012D	MAPP0006C	MAPG0006C	–
4	7	DVSP0009E	DVSG0009E	V1K8A00	V1K8A01	FN5040-10-83	FN5045-10-44	SWNM0012D	SWNG0012D	MAPP0008C	MAPG0008C	HG4LX54ST
5.5	10	DVSP0012E	DVSG0012E	V1K12A00	V1K12A01	FN5040-17-83	FN5045-17-33	SWNM0012D	SWNG0012D	MAPP0011C	MAPG0011C	HG5LX54ST
7.5	14	DVSP0017E	DVSG0017E	V1K16A00	V1K16A01	FN5040-17-83	FN5045-17-33	SWNM0022D	SWNG0022D	MAPP0014C	MAPG0014C	HG7LX54ST
11	20	DVSP0022E	DVSG0022E	V1K21A00	V1K21A01	FN5040-24-84	FN5045-24-33	SWNM0022D	SWNG0022D	MAPP0021C	MAPG0021C	HG11LX54ST
15	27	DVSP0027E	DVSG0027E	V1K27A00	V1K27A01	FN5040-38-84	FN5045-38-33	SWNM0027D	SWNG0027D	MAPP0027C	MAPG0027C	HG15LX54ST
18.5	33	DVSP0035E	DVSG0035E	V1K35A00	V1K35A01	FN5040-38-84	FN5045-38-33	SWNM0045D	SWNG0045D	MAPP0034C	MAPG0034C	HG18LX54ST
22	40	DVSP0045E	DVSG0045E	V1K45A00	V1K45A01	FN5040-48-85	FN5045-48-34	SWNM0045D	SWNG0045D	MAPP0044C	MAPG0044C	HG22LX54ST
30	55	DVSP0055E	DVSG0055E	V1K55A00	V1K55A01	FN5040-62-86	FN5045-62-34	SWNM0065D	SWNG0065D	MAPP0052C	MAPG0052C	HG30LX54ST
37	66	DVSP0080E	DVSG0080E	V1K80A00	V1K80A01	FN5040-75-87	FN5045-75-35	SWNM0065D	SWNG0065D	MAPP0066C	MAPG0066C	HG37LX54ST
45	80	DVSP0080E	DVSG0080E	V1K80A00	V1K80A01	FN5040-115-87	FN5045-115-35	SWNM0110D	SWNG0110D	MAPP0083C	MAPG0083C	HG45LX54ST
55	97	DVSP0110E	DVSG0110E	V1K110A00	V1K110A01	FN5040-115-87	FN5045-115-35	SWNM0110D	SWNG0110D	MAPP0103C	MAPG0103C	HG55LX54ST
75	130	DVSP0130E	DVSG0130E	V1K130A00	V1K130A01	FN5040-180-99	FN5045-180-99	SWNM0130D	SWNG0130D	MAPP0128C	MAPG0128C	HG75LX54ST
90	160	DVSP0160E	DVSG0160E	V1K160A00	V1K160A01	FN5040-180-99	FN5045-180-99	SWNM0160D	SWNG0160D	MAPP0165C	MAPG0165C	HG90LX54ST
110	195	DVSP0200E	DVSG0200E	V1K200A00	V1K200A01	FN5040-260-99	FN5045-260-99	–	–	MAPP0208C	MAPG0208C	HG110LX54ST
132	230	DVSP0250E	DVSG0250E	V1K250A00	V1K250A01	FN5040-260-99	FN5045-260-99	–	–	MAPP0240C	MAPG0240C	HG132LX54ST
160	280	DVSP0305E	DVSG0305E	V1K305A00	V1K305A01	FN5040-410-99	FN5045-410-99	–	–	MAPP0320C	MAPG0320C	HG160LX54ST
200	350	DVSP0365E	DVSG0365E	V1K362A00	V1K420A01	FN5040-410-99	FN5045-410-99	–	–	MAPP0403C	MAPG0403C	HG200LX54STC
250	440	DVSP0515E	DVSG0515E	V1K480A00	V1K480A01	FN5040-480-99	FN5045-480-99	–	–	MAPP0482C	MAPG0482C	HG250LX54STC
280	490	DVSP0600E	DVSG0600E	V1K600A00	V1K600A01	FN5040-660-99	FN5045-660-99	–	–	MAPP0636C	MAPG0636C	HG315LX54STC
315	550	DVSP0600E	DVSG0600E	V1K600A00	V1K600A01	FN5040-660-99	FN5045-660-99	–	–	MAPP0636C	MAPG0636C	HG315LX54STC
335	590	DVSP0600E	DVSG0600E	V1K600A00	V1K600A01	FN5040-660-99	FN5045-660-99	–	–	MAPP0636C	MAPG0636C	HG355LX54STC
355	620	–	–	V1K750A00	V1K750A01	FN5040-660-99	FN5045-660-99	–	–	MAPP0636C	MAPG0636C	HG355LX54STC
400	700	–	–	V1K750A00	V1K750A01	FN5040-750-99	FN5045-750-99	–	–	MAPP0786C	MAPG0786C	HG400LX54STC
450	790	–	–	V1K820A00	V1K820A01	FN5040-880-99	FN5045-880-99	–	–	MAPP0850C	MAPG0850C	HG450LX54STC
500	880	–	–	–	–	FN5040-1200-99	FN5045-1200-99	–	–	MAPP1000C	MAPG1000C	HG500LX54STC
560	980	–	–	–	–	FN5040-1200-99	FN5045-1200-99	–	–	MAPP1000C	MAPG1000C	HG560LX54STC
630	1100	–	–	–	–	FN5040-1200-99	FN5045-1200-99	–	–	MAPP1200C	MAPG1200C	HG630LX54STC
670	1170	–	–	–	–	FN5040-1200-99	FN5045-1200-99	–	–	MAPP1200C	MAPG1200C	HG710LX54STC
710	1240	–	–	–	–	–	–	–	–	–	–	HG710LX54STC
800	1400	–	–	–	–	–	–	–	–	–	–	–
1000	1740	–	–	–	–	–	–	–	–	–	–	–
1200	2100	–	–	–	–	–	–	–	–	–	–	–
1320	2500	–	–	–	–	–	–	–	–	–	–	–

FUSECO

Sinexcel Active Harmonic Filter (AHF)

Harmonics are extra frequencies that when present in an electrical system, cause the current and voltage to be distorted and deviate from sinusoidal waveforms. Harmonic currents are caused by non-linear loads connected to the distribution system (rectifiers, discharge lighting, or saturated magnetic devices). A load is said to be non-linear when the current it draws does not have the same waveform as the supply voltage.

Variable Speed Drives are prolific creators of harmonics in electrical systems and as a result, most of the harmonic mitigation effort focuses on the input side and output side of a VSD. Harmonics are very harmful within an electrical system and can have serious consequences. The presence of harmonics reduces the life of equipment. It is possible that the investment that you made in your motors & drives will not be realised if they are damaged and need replacing before their expected life span. This can be very expensive. Harmonic mitigation is taking action to minimise the presence of harmonics in your electrical system and can achieve great cost savings as well as comply with the Australian standards for harmonic voltage distortion.

- Wall Mounted Solutions
- Load Balancing
- Reactive Power (PFC)
- Advanced Harmonic Compensation

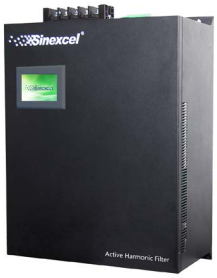
Sinexcel®

The Sinexcel AHF (Active Harmonic Filter)

Sinexcel have applied new generation thinking and innovative design principles to create a new range of Active Harmonic Filters that have redefined what is possible from a cost vs performance vs space perspective. Their performance and ease of use is unsurpassed, able to compensate the 2nd to the 50th harmonic order or the simultaneous compensation of all 50 harmonic orders in real time!

Operating with up to 98.5% efficiency, the Sinexcel AHF offers instantaneous, dynamic harmonic compensation, ideal for the challenging demands of modern electrical environments. The Sinexcel AHF are a compact, light-weight and modular design, available in wall mounting and rack/cabinet configurations. The Sinexcel AHF has set the standards for all others to follow.

The AHF Range



Wall-Mount Solutions

25A & 35A
440W x 150D x 485H (mm)
Weight: 18kg

50A & 60A
500W x 180D x 540H (mm)
Weight: 23kg

75A
500W x 190D x 586H (mm)
Weight: 28kg

100A
500W x 200D x 605H (mm)
Weight: 35kg

150A
500W x 273D x 638H (mm)
Weight: 44kg

300A
500W x 370D x 729H (mm)
Weight: 110kg

Rack-Mount Solutions

25A & 35A
440W x 490D x 150H (mm)
Weight: 18kg

50A & 60A
500W x 515D x 180H (mm)
Weight: 23kg

75A
500W x 586D x 190H (mm)
Weight: 28kg

100A
500W x 605D x 200H (mm)
Weight: 35kg

150A
500W x 630D x 270H (mm)
Weight: 44kg

300A
500W x 726D x 370H (mm)
Weight: 110kg

FUSECO

The AHF Range

Flexi-Cabinet Series

Capacity: Up to 900A
800W x 1000D x 2200H (mm)

Capacity: Up to 750A
800W x 800D x 2200H (mm)

Features

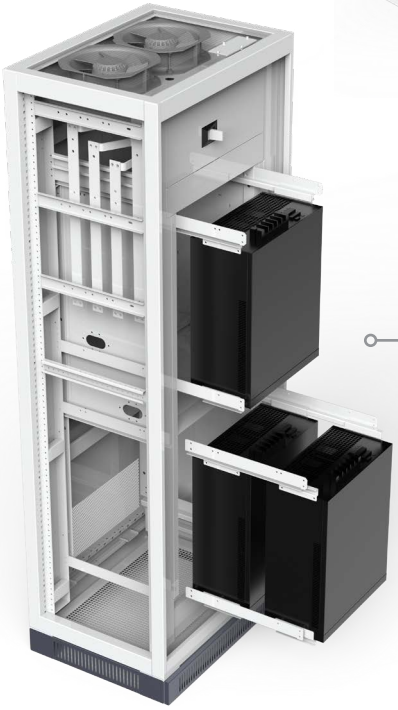
- Large Capacity

Slimline Series

Capacity: Up to 750A
600W x 1000D x 2200H (mm)

Features

- Fits in Narrow Spaces (600mm wide)



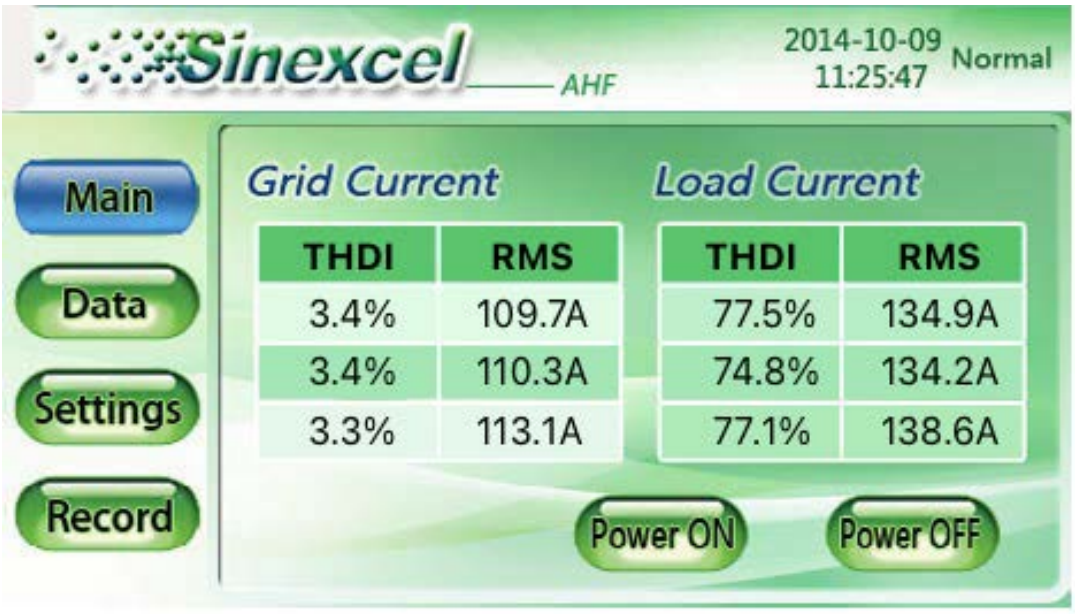
Space Saver Series

Capacity: Up to 450A
800W x 600D x 2200H (mm)

Features

- Only 600mm deep
- Top ventilated

AHF in Action



This screen shot is from a Sinexcel AHF unit operating at one of our customer locations.

Please note:

- The Load Current THDI, which is the Total Harmonic Distortion Current across the 3 phases at the site. It is between 74.8% and 77.5% which is very high.
- The Grid Current THDI, which is the Total Harmonic Distortion Current across the 3 phases after the Sinexcel Active Harmonic Filter has compensated the current. It is between 3.3% and 3.4% which is a significant reduction in harmonics. This is an exceptional result and indicative of the advanced performance of the Sinexcel 3-level topology and the algorithms employed by Sinexcel engineering.
- The second benefit is the reduction in the RMS current as shown by the Load and Grid RMS figures in the display. This is achieved by the injection of the compensating current from the Sinexcel Active Harmonic Filter to reduce the damaging effects of the load harmonics and the natural by-product of this is the correcting of the distortion power factor.

Unprecedented Performance

- Up to 300A capability from a single wall-mounted module – can be parallel connected for unlimited capacity.
- Up to 300A capability from a single rack-mounted module.
- Up to 900A capability from a single cabinet solution

FUSECO

Features & Benefits

Compact Size and Light Weight

- Can be wall mounted and installed in small spaces.
- Wall mounted units can be parallel connected for unlimited capacity.

Harmonics Compensation Capability

- Harmonics filtering performance THDi < 5%.
- Selection of every harmonic to the 50th order.
- Filter up to 50 harmonics simultaneously.
- Harmonic filtering levels [%] can be pre-configured.
- Resonance protection by means of pre-configuring harmonic filtering levels for the potential resonance zones.
- Capable of suppressing ripple currents effectively and promote a high compensation precision for the output waveform with respect to the sinusoidal waveform.
- Unique 3-level topology based on a zero voltage transformation design & incorporating a high frequency inductor technology results in up to 98.5% efficiency.

Load Balancing and Reactive Power

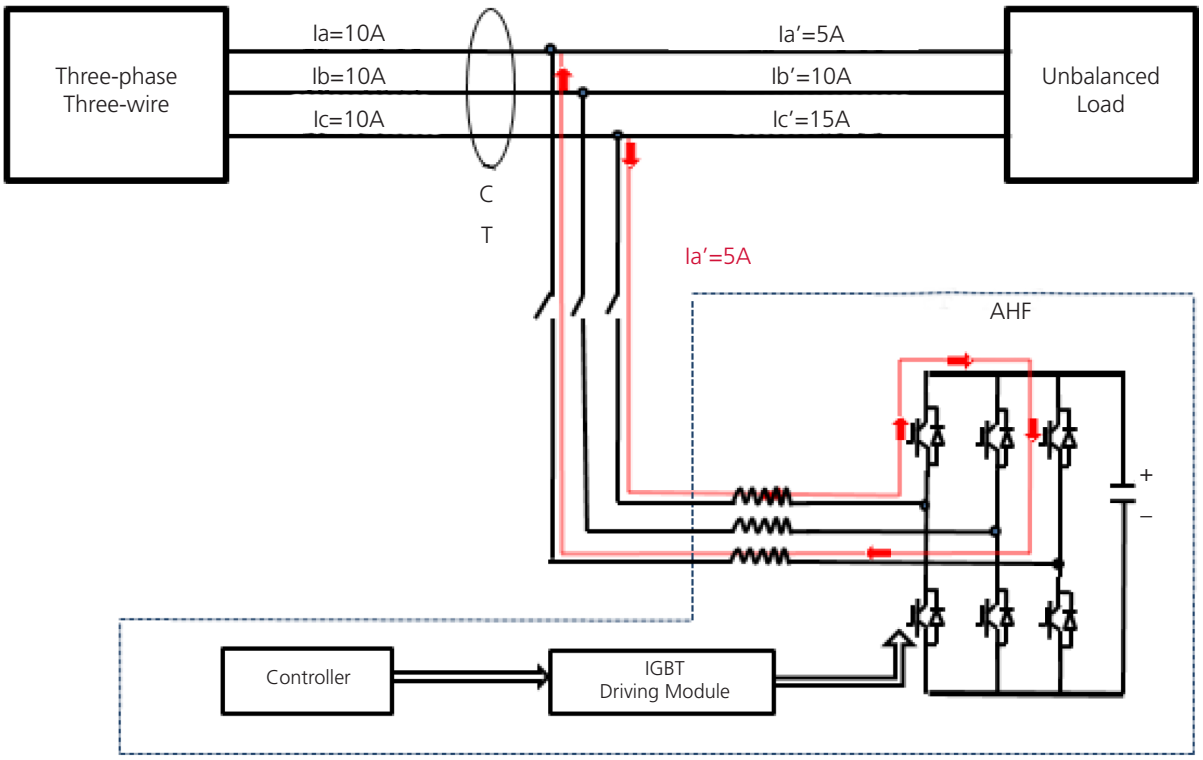
- Capable of measuring each phase and then redirecting the existing load current to balance the phases.
- Also capable of using their remaining capacity to dynamically inject reactive power to correct the power factor.
- It is possible for the user to program the unit to prioritise load balancing or reactive power, depending on the application.

Available in Various Configurations

- 3-Wire and 4-Wire versions available
- Available in 690V
- Available in IP20, IP31 and IP54 versions to suit a wide variety of industry applications

Flexibility and Ease of Commissioning

- Designed to be a 'Plug and Play' experience for the user.
- Available in wall mounting or rack/cabinet options.
- Unlimited parallel operation of modular AHF units in combination as per system requirements.
- Installation & commissioning process is the industry benchmark for simplicity and ease of use.



User-friendly Interface and Monitoring

- Very easy to operate.
- Online monitoring and programming available. Presents information in terms of numerical data, waveform analysis, etc.
- Incorporates a backlit HMI graphical user interface, offering direct control, complete configuration, monitoring and harmonic analysis of the AHF without the need of a PC.

Backlit Display

- Incorporates a high level of readability and ease of menu navigation, the backlit LCD display offers:
- Access and configuration of operating parameters.
- Measurement data in numerical, graphical and spectrum formats.
- Operation status inclusive of detailed alarms and fault messages.
- Password protected for critical settings.

1 Year Warranty

Standards

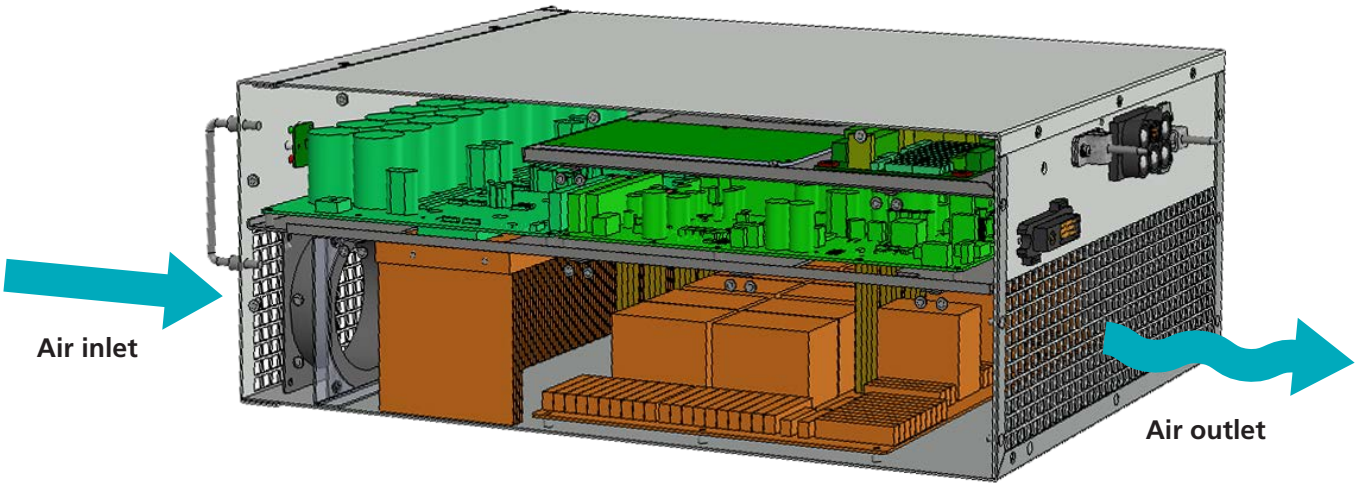
IEC61000 / IEC60146 / EN55011 / EN50091 / IEEE519

Measurements

- Provides a comprehensive set of measurement data for analysis, such as:
- Network RMS voltages and currents
- Network Voltage and current distortions (THDu and THDi)
- Total RMS load currents and THDi
- System frequency
- Load factor
- Compensated RMS currents
- Comparison of PF (before and after)
- Graphical waveform of network voltages and currents, load and compensated currents
- Harmonic spectrum for network and load currents, from 2nd to 50th harmonic order

Designed for Efficiency and Minimal Maintenance

- Minimises dust ingress
- Electronic components separated from heat producing components and housed in their own sealed compartment, resulting in greater protection from the effects of heat and dust ingress.
- Optimum heat dissipation
- Heat sinks, IGBT's, inductors and other heat producing components housed in a separate compartment optimised for efficient ventilation and cooling.



FUSECO

Advanced Static Var Generator (ASVG)

The Sinexcel ASVG represents the latest generation technology in the power factor correction field with the added functionality of being able to compensate low order harmonics (3rd – 11th harmonic). It operates by detecting the load current on a real-time basis through an external CT (current transformer) and determining the reactive content of the load current. The data is analysed and the ASVG's controller drives the internal IGBT's by using PWM signals to make the inverter produce the exact reverse reactive current of the corresponding load reactive content which is injected into the grid.

The ASVG range offers instantaneous, dynamic step-less power factor compensation as well as low order harmonic mitigation, ideal for the challenging demands of modern electrical environments. Sinexcel ASVG solutions do not need an AC capacitor bank and offer many advantages due to their compact & modular configuration (including wall-mount options).

Features

- Exceptional power factor correction performance
- Dynamic step-less compensation
- Compensates low order harmonics (3rd – 11th)
- Wall mounted modules can be parallel connected
- Corrects lagging (inductive loads) AND leading (capacitive loads)
- Corrects Load Imbalance
- Operates in all 3 Phases
- Not affected by resonance & harmonics
- Can work with & enhance existing capacitor bank systems
- Can operate at low voltages

ASVG Range

Wall-Mount Solutions

50kVAr
500W x 190D x 585H (mm)
weight: 28kg

100kVAr
00W x 286D x 557H (mm)
weight: 44kg

200kVAr
00W x 370D x 722H (mm)
weight: 110kg

Rack-Mount Solutions

50kVAr
500W x 600D x 190H (mm)
Weight: 28kg

100kVAr
500W x 560D x 269H (mm)
Weight: 44kg

200kVAr
500W x 722D x 370H (mm)
Weight: 110kg

Cabinets

Up to 500kVAr
Standard Flexi-Cabinet
800W x 800D x 2200H (mm)

Up to 600kVAr
Large Flexi-Cabinet
800W x 1000D x 2200H (mm)

Installation of Current Transformers (CT's)

The current transformer (CT) plays a key role in the normal operation of an AHF/SVG/ASVG, so the correct selection and installation of CT's is vital. In a 3-phase 3-wire system, two CT's are required, each installed on phase A and phase C; while in 3-phase 4-wire system, three CT's are required, each installed on the circuits of phase A, phase B and phase C.

In the AHF/SVG/ASVG module, the allowable ratio of an external CT is 150:5 (min) – 10,000:5 (max). The ratio can be selected between the two levels in accordance with the actual load current. When selecting the CT ratio, the actual magnitude of load current should be taken into consideration so as to obtain a more accurate compensation. Generally, a selection of x1.5 of the maximum current during normal operation is preferred, and an appropriate level of margin is recommended to ensure more accurate harmonic suppression.

For example, suppose the maximum load current detected is 1,000A. The best selection of CT ratio is between

1,500:5 to 2,000:5. The accuracy of the external CT should be above level 0.2 (solid core) or above level 0.5 (split core). A lower degree of accuracy may affect the compensation accuracy.

Solid Core CT's

SERIES	DESCRIPTION	RATIO RANGE (5A Secondary)	BUSBAR (mm)	CABLE DIAMETER (mm)
TUC30 Series	Solid Core	200-600	30 x 10	25
TUC40 Series	Solid Core	50-1000	40 x 10	32
TUC50 Series	Solid Core	400-2000	50 x 10	40
TUC60 Series	Solid Core	400-2000	60 x 10	51
TUC80 Series	Solid Core	400-2500	80 x 30	65
TU100PSH Series	Solid Core	400-5000	100 x 30 80 x 50	85

Split Core CT's

SERIES	DESCRIPTION	RATIO RANGE (5A Secondary)	BUSBAR (mm)	CABLE DIAMETER (mm)
TA30P Series	Split Core	100-400	30 x 20	20
TA60P Series	Split Core	250-1000	60 x 30	30
TA80P Series	Split Core	250-1000	80 x 50	50
TA100P Series	Split Core	250-2000	100 x 80	80
TA125P Series	Split Core	500-3000	125 x 80	80
TA160P Series	Split Core	500-5000	160 x 80	80

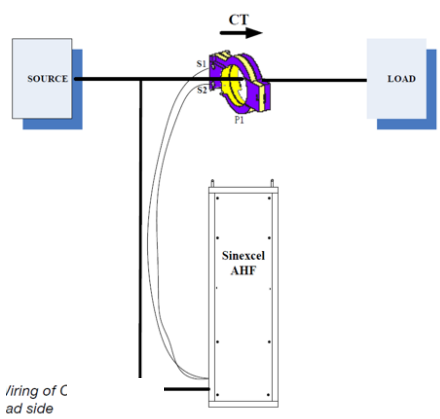
Installation on the Load Side

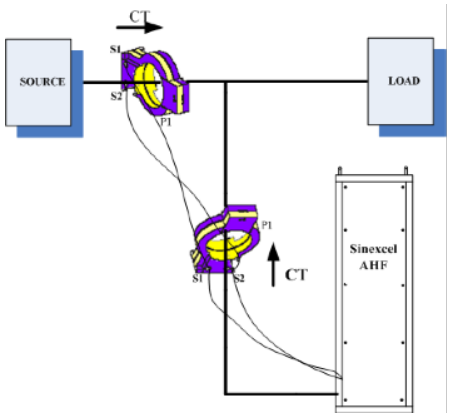
As shown in the figure below, the signal is sent to the AHF/SVG/ASVG by a CT installed at the load side. In a 3-phase 4-wire system, one set of 3 CT's is required to detect the current of the harmonic source. The polarity of the CT's must be correct and the phase rotation must also be correct.

Installation on the Supply Side

If it's not possible to install the CT's on the load side, they can be installed on the supply side. When using one module you can have one set of CT's on the supply side.

However when using multiple modules, a second set of CT's must be connected in parallel on the cables supplying the AHF/SVG/ASVG to measure the combined output of the modules therefore subtracting it from the main measuring CTs as per the diagram below.





Please note that the above diagrams are indicative of some common installations. For other configurations, please contact Fuseco.

FUSECO

MTE Matrix® AP Filters (5% THD)

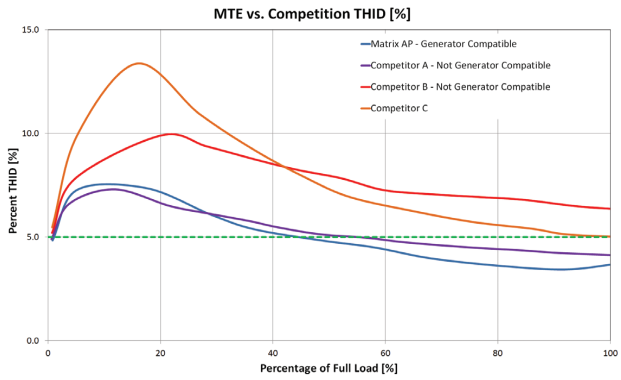
The key to success: Adapt.

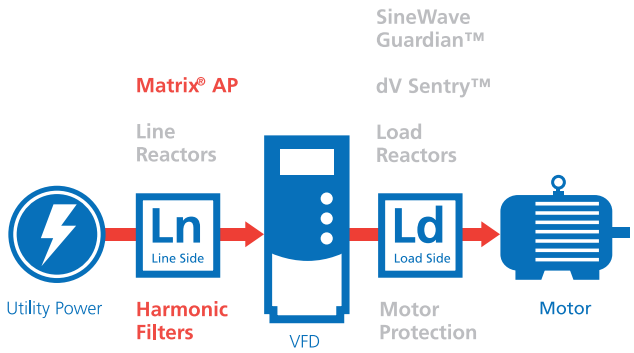
Adaptive Passive Technology for superior harmonic mitigation at varying loads.

The MTE Matrix AP is the most advanced passive filter on the market today. Most traditional filters work fine at 100% power load but severely under-perform at lower loads.

The MTE Matrix AP has Adaptive Passive Technology that virtually eliminates harmonic distortion by adapting to various power loads. Its unique design generates less heat, is easy to install and maintain and is generator compatible.

It delivers better THDi performance, increases the reliability and service life of electric installations, increases energy efficiency and allows you to meet Power Quality standards such as IEEE 519.





Key Features:

- **5% THDi Performance**
  The MTE Matrix AP offers equal to or better than 5% THDi performance at full load current and starts to achieve that 5% performance from loads as low as 40% of full load current.
- **Adaptive Passive Technology**
  The Matrix AP features MTE's patented Adaptive Passive Technology for superior harmonic mitigation and better THDi performance over a wider load range.
- **3 Year Warranty (industry leading)**
- **Reduce Maintenance Costs**
  Extends the service life of electrical equipment due to the virtual elimination of CEMF and the skin effect, the Matrix AP extends the life of electrical equipment, especially transformers and motors.
- **Ease of Installation**
  Passive filters are virtually 'Plug and Play'.
- **Reduces Downtime**
  Alleviates system downtime by preventing blown fuses and tripped circuit breakers.
- **Intelligent Design - Less Cost to Install**
  The unique design of the MTE Matrix AP filter incorporates only one reactor which has the input and the shunt coil on the same core. This requires less cabling and connections by the installer, therefore less cost to install.
- **Enclosed Filters Do Not Require Fans**
  When the Matrix AP filters are built within an enclosure to comply with IP20 or IP21 requirements, their unique patented design results in such low heat loss that they do not require fan assisted cooling. This design removes the traditional risk of filter damage in the event of a fan malfunction.
- **Better Power Factor and Compatibility with Generators**

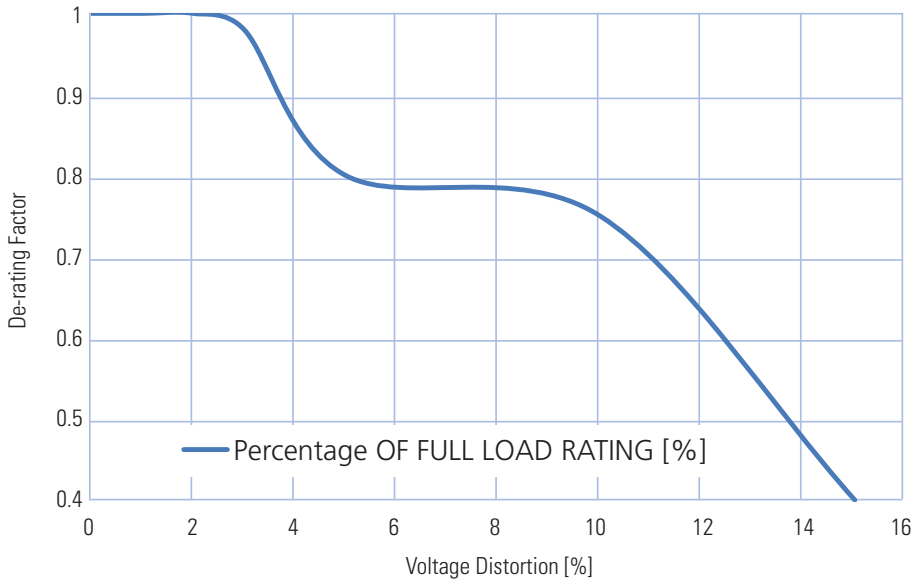
Performance Specifications

Input Voltages	480V 60Hz 380V/400V/415V 50Hz 600V 60Hz 690V 50Hz
Total Harmonic Current Distortion	8% Max at 30% Load 5% Max at Full Load
Load	6 pulse rectifier
Input Voltage	Nominal voltage VAC +/– 10%, 3 Phase
Frequency	Nominal Frequesncy +0.75Hz
Insertion loss at full load	<4%
Efficiency	97% – 99%
Operating Temperature	–40°C to +50°C Open Panel Filters –40°C to +40C°–45°C Enclosed Filters –40°C to +90°C Storage
Altitude without Derating	1000 meters (3,300 feet)

Performance with Unbalanced Line Voltage (Typical)

All Components at Nominal Values and Worse Case Service Conditions	
100% Load	
Nominal THDi	4.2%
1% Unbalance	4.4%
2% Unbalance	4.8%
3% Unbalance	5.4%
30% Load	
Nominal THDi	7.0%
1% Unbalance	7.3%
2% Unbalance	7.9%
3% Unbalance	8.8%

Voltage Distortion De-Rating Curve



This plot assists in proper de-rating of a Matrix AP Harmonic Filter in environments with a given voltage distortion. Example: In a system with 10% voltage distortion, a Matrix filter will need to be oversized by 25% to obtain the same performance as an appropriate filter in a 0% distortion environment.

FUSECO

Applications for Passive Filters

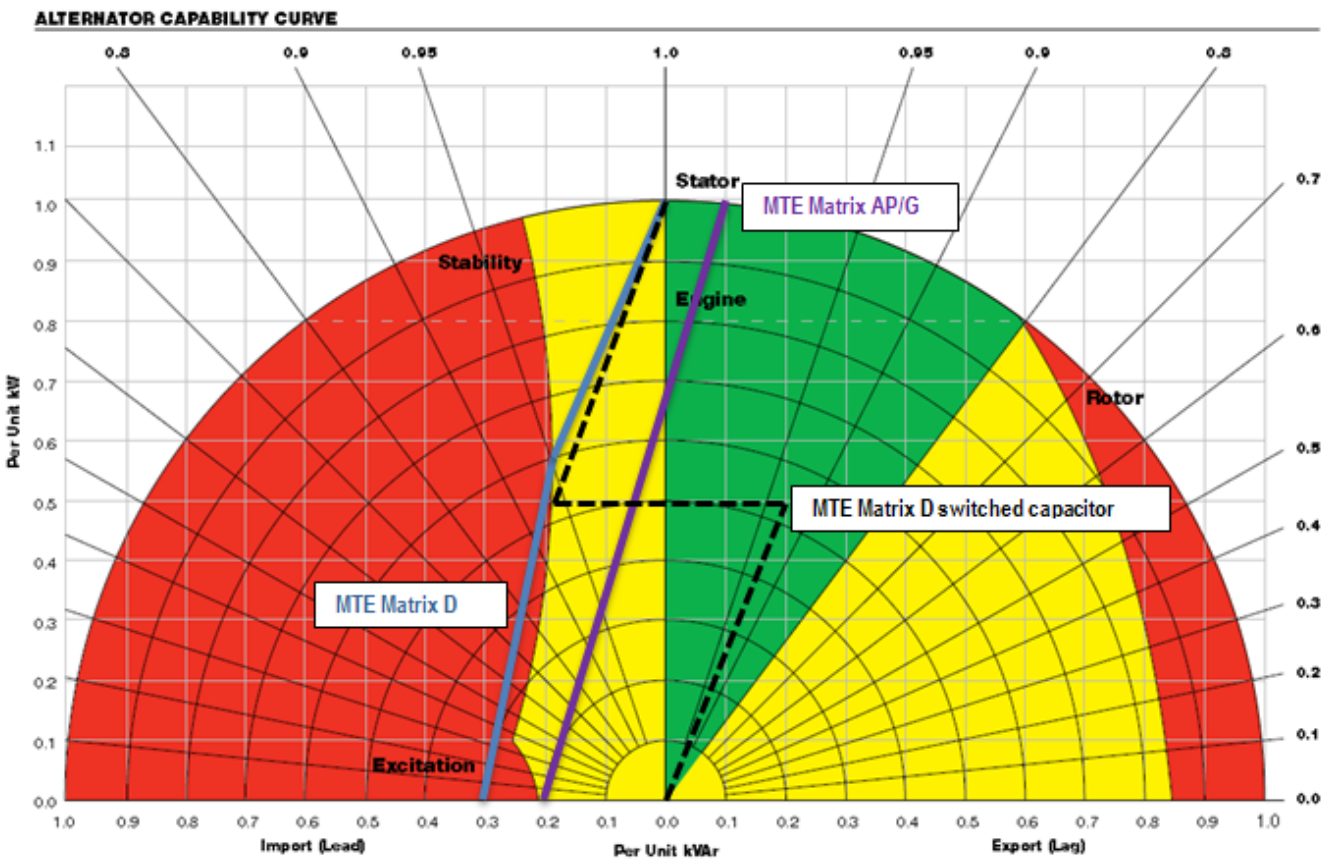
Passive Harmonic Filters for Generator Power Supply Applications

The ability of a generator to handle leading power factor loads is often raised as a concern. Although it is true that excessive capacitive reactive power can cause voltage regulation, excitation control and other issues with a generator's operation, generators can tolerate a leading power factor at certain levels. All generator manufacturers publish reactive power capability curves for their generators from which a user can determine the acceptable levels of reactive power for the generator, both capacitive and inductive.

Six pulse VSD loads operated with a passive harmonic filter have characteristics that can impose a leading power factor (kVAr) onto the power source. While these loads are typically not a problem for utility power sources, leading power factor can cause a generator to shut down or prevent certain loads from operating properly under generator power. Control systems used in generators are very sensitive to capacitive kVAr from loads and exceeding their limit will result in the generator shutting down due to over-voltage.

At the same time, VSD manufacturers have started to use Passive Harmonic Filters to limit the harmonic current distortion feeding back to the power source. A Passive Harmonic Filter can produce a leading power factor at light loads and this can be very disruptive to generator operation. At light loads there may be excess filter capacitance, causing a leading power factor on the generator. A utility supply simply absorbs the reactive power output because it is extremely large relative to the filter system. The ideal solution is to choose a harmonic filter that will not adversely affect the generator's operation.

To work with generators, the harmonic filter's capacitance must not exceed the alternator's ability to absorb reverse kVAr loading. The ideal choice should be a filter that has a low kVAr (15% of its kW rating) such as the MTE Matrix AP filter. The Matrix AP filter possesses better control of leading power factor and will always be in the 'generator safe operating area'. Due to the fact that the Matrix AP filter operates in a safe power factor range for gen-sets, most applications do not require the capacitors switched in and out. This results in an increase in the life span of the capacitors.



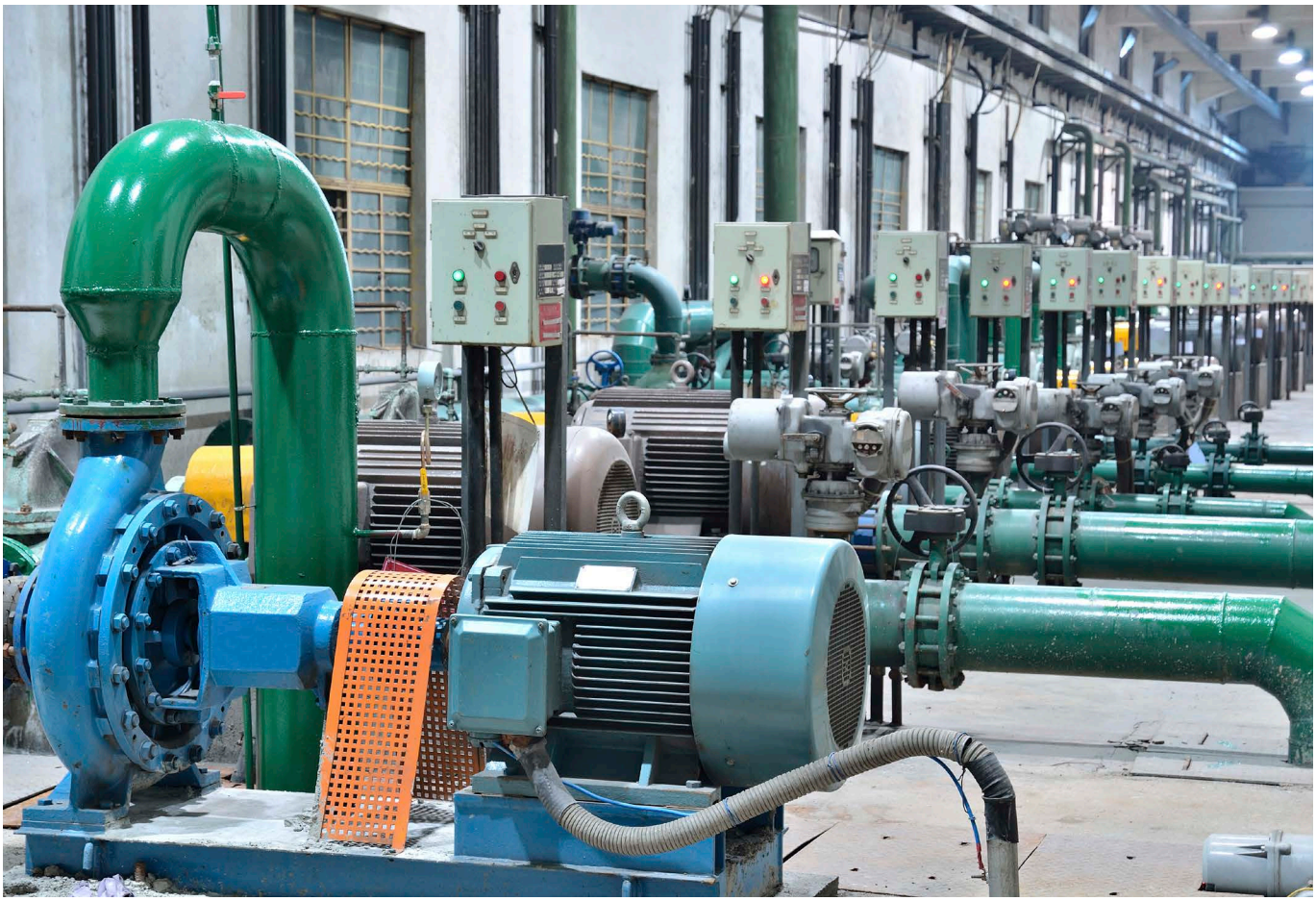
Irrigation and Pumping Station Applications

The use of VSDs in the electrical systems of irrigation and pumping stations has grown by 60% in the last five years. This clearly indicates that the concept of saving energy is being accepted and adopted rapidly within the industry.

The remote area irrigation systems and pumping stations equipped with VSDs often experience problems related to harmonics on grid or generator supply. This often leads to disturbances in the supply systems of nearby residential areas. For these remote sites, achieving the mitigation of harmonics in the electrical system can be a big challenge.

Solutions for Harmonic Mitigation and the Protection of Motors

- As a general guide, for cable runs up to 30m, reactors can be a cost effective solution.
  Refer to page 158 for information on our range of MTE reactors
- For cable runs of 30m – 100m, dV/dt filters are a suitable choice and also provide the added benefit of protecting motors from long lead peak voltages and voltage spikes.
  Refer to page 163 for information on our range of MTE dV Sentry dV/dT Filters
- For cable runs above 100m, sine wave filters are a great choice. With their ability to reduce eddy currents, stray flux losses, bearing currents, torque ripple and voltage wave reflection, sine wave filters provide the ultimate motor protection.
  Refer to page 160-162 for information on our range of Sine Wave Filters
- The design of the MTE Matrix AP passive filters is suitable for such remote applications as they are extremely robust, reliable and virtually 'plug and play'. The specially designed capacitors with screw on terminals provide reliability and require minimal maintenance. Furthermore, they mitigate the harmonics (THDi) to <5%.
  Refer to page 154-155 for information on the MTE Matrix AP Filters
- For IP54 applications, the TCI HG7 series of passive harmonic filters is ideal.



FUSECO

MTE RL Series

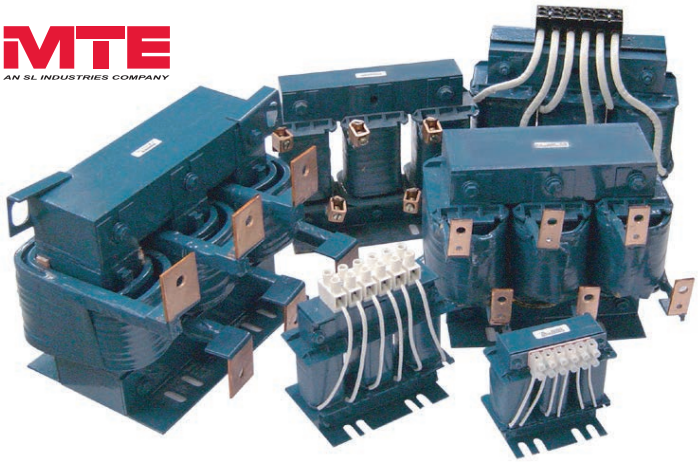
Peace of mind included.

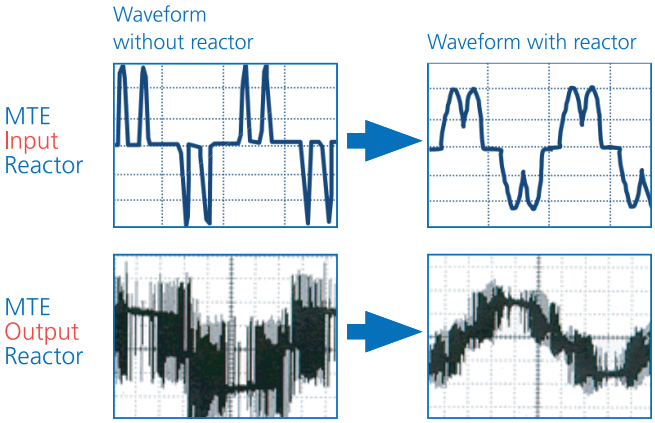
Reactors provide a cost effective solution to power quality degradation due to the increase in non-linear loads such as those produced by variable speed drives (VSDs).

The MTE RL series of line and load reactors are best-in-class power quality units with a long history of proven performance. Rugged and robust, they are unequalled in absorbing power line disturbances that can damage or shut down VSDs and other sensitive equipment. They are built to withstand even the most severe power spikes. They work on both the line side and load side to give you an easy solution that reduces nuisance tripping, reduces harmonic distortion and minimises long lead effects.

The RL series reactors are a robust, high performance filtering solution for virtually any 4 or 6-pulse rectifier or power conversion unit. There is no need to de-rate these reactors. They are harmonic compensated and protected to assure optimum performance in the presence of harmonics, and can help you meet IEEE-519.

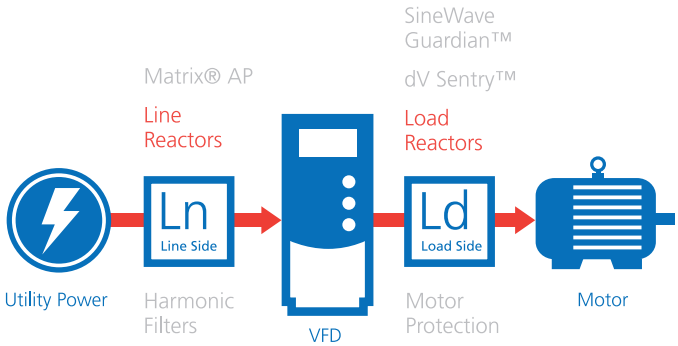
Improved power quality, enhanced productivity and complete peace of mind are easy with RL line/load reactors.





Key Features:

- **Available for 1A to 1,500A applications**
- **Impedance options 3% and 5%**
- **Most robust, highest continuous service factor**
- **Low watts loss**
- **Ease of installation**
- **Reduces energy costs**
- **Reduces audible noise**
- **Available in multiple cabinet designs IP00, IP20 & NEMA 3R**
- **Performance and durability that is unmatched by the competition**
- **3 year warranty (industry leading)**



Preliminary Performance Specifications

Impedence Levels	3% and 5%
Continuous Service Factor	Reactors rated 1 to 750 Amps – 150% of rating Reactors rated above 750 Amps – 125% of rating
Overload Rating	200% of rated for 30 minutes 300% of rated for 1 minute
Voltage Range	208V – 690V
Current Range	1A – 1,500A
Temperature Rise	135°C
Ambient Temperature	–40°C to 50°C
Altitude Maximum	1,000 meters
Fimda,emta;Freqiemcu	50/60Hz
Inductance Curve	100% at 100% Current 100% at 150% Current 50% at 350% Current

MTE RL Reactor Selection Table

OPEN (IP00) PART NUMBER	AMP RATING	INDUCTANCE (mH)	WATTS LOSS	OPEN WEIGHT (kg)	SIZE (mm) H x W x D
RL-00102	1	50	12.8	0.95	89 x 97 x 31
RL-00103	1	36	11.9	0.95	89 x 97 x 31
RL-00201	2	12	7.5	1.81	104 x 112 x 71
RL-00202	2	20	11.3	1.81	104 x 112 x 71
RL-00403	4	9	20	2.26	104 x 112 x 86
RL-00404	4	12	21	2.72	104 x 112 x 86
RL-00803	8	5	25.3	4.98	122 x 152 x 86
RL-00804	8	7.5	28	5.89	122 x 152 x 86
RL-01202	12	2.5	31	4.53	127 x 152 x 84
RL-01203	12	4.2	41	8.16	127 x 152 x 84
RL-01802	18	1.5	43	5.44	135 x 152 x 89
RL-01803	18	2.5	43	7.25	155 x 206 x 102
RL-02502	25	1.2	52	6.35	147 x 183 x 89
RL-02503	25	1.8	61	9.07	147 x 183 x 109
RL-03502	35	0.8	54	7.25	147 x 183 x 102
RL-03503	35	1.2	54	13.6	188 x 229 x 119
RL-04502	45	0.7	62	12.7	188 x 229 x 119
RL-04503	45	1.2	65	17.69	185 x 229 x 135
RL-05502	55	0.5	67	12.24	178 x 229 x 135
RL-05503	55	0.85	71	18.59	178 x 229 x 152
RL-08002	80	0.4	86	14.96	183 x 229 x 165
RL-08003	80	0.7	96	27.66	216 x 274 x 173
RL-10002	100	0.3	84	16.78	185 x 229 x 173
RL-10003	100	0.45	108	33.56	210 x 274 x 156
RL-13002	130	0.2	180	19.5	183 x 229 x 173
RL-13003	130	0.3	128	29.02	216 x 279 x 156
RL-16002	160	0.15	149	23.13	211 x 274 x 152
RL-16003	160	0.23	138	32.65	216 x 292 x 229
RL-20002B14	200	0.11	168	24.49	191 x 229 x 211
RL-20003B14	200	0.185	146	45.35	211 x 274 x 254
RL-25002B14	250	0.09	231	36.28	216 x 274 x 229
RL-25003B14	250	0.15	219	56.69	284 x 366 x 262
RL-32002B14	320	0.075	264	46.26	229 x 274 x 254
RL-32003B14	320	0.125	351	72.57	286 x 366 x 267
RL-40002B14	400	0.06	333	53.52	286 x 381 x 292
RL-40003B14	400	0.105	293	67.58	286 x 366 x 318
RL-50002	500	0.05	340	53.52	292 x 366 x 292
RL-50003	500	0.085	422	95.25	292 x 366 x 338
RL-60002	600	0.04	414	79.37	286 x 366 x 305
RL-60003	600	0.065	406	122.47	286 x 366 x 381
RL-75002	750	0.029	630	86.18	292 x 366 x 318
RL-75003	750	0.048	552	120.2	368 x 366 x 356
RL-85002B14	850	0.027	930	97.52	394 x 452 x 394
RL-85003B14	850	0.042	1133	142.88	394 x 452 x 445
RL-90002B14	900	0.025	1020	97.52	394 x 452 x 394
RL-90003B14	900	0.04	1365	142.88	401 x 452 x 434
RL-100002B14	1000	0.022	1090	97.52	394 x 452 x 394
RL-100003B14	1000	0.038	1500	142.88	401 x 452 x 445
RL-120002B14	1200	0.019	1130	124.73	394 x 452 x 452
RL-120003B14	1200	0.03	1550	176.9	391 x 442 x 465
RL-140002	1400	0.016	1523	238.13	432 x 483 x 483
RL-140003	1400	0.027	1680	385.55	432 x 559 x 559
RL-150002	1500	0.015	1671	306.17	432 x 429 x 406
RL-150003	1500	0.025	1815	408.23	432 x 559 x 559

Impedance Rating:

- 3% impedance reactors are typically sufficient to absorb power line spikes and motor current surges. They will prevent nuisance tripping of drives or circuit breakers in most applications. They are also suitable for use as motor chokes/load reactors.
- 5% impedance reactors are best for reducing harmonic currents and frequencies. Use them when you must reduce VFD drive generated harmonics, and to reduce motor operating temperature, or to reduce motor noise. For complete IEE-519 compliance for VSD's please see the AP Matrix Passive Harmonic Filters on pages 154-155 or the Sinexcel Active Harmonic Filters on pages 146-151.

Please note:

- The recommended reactor selections above are based on fundamental current ratings. Contact Fuseco with any questions regarding the proper reactor selection.
- The effective impedance of the reactor changes with actual RMS current. A 5% impedance reactor becomes 3% if its current is reduced to 60%.
- Weights and dimensions are for reference only and are subject to change without notice.

FUSECO

Schaffner Sine Wave Filters

Deployed at the output side of a VSD, Schaffner sine wave filters are a proven motor protection solution that ensure system reliability and motor longevity.

Schaffner sine wave filters can facilitate the use of unshielded motor cables, the use of multiple motors in parallel on the same driver or the retrofit of modern drives in existing installations with old motors and unshielded cabling. A great investment for your electrical system.

schaffner

FN 5040
500V
IP00 (open panel)

FN 5045
500V
IP20 (enclosed)

Key Features:

- Converts the rectangular PWM output voltage of motor drives into a smooth sine wave with low residual ripple.
- Allows for the use of unshielded cables (lower project costs).
- Allows for the use of longer motor cables.
- Reduces eddy currents, stray flux losses and bearing currents.
- Improves bearing life time because of bearing currents caused by circulating currents, eddy currents and stray flux losses.
- Eliminates torque ripple and voltage wave reflection.
- Eliminates premature motor damage caused by high dv/dt, over-voltages, cable ringing, motor overheating, pulse pattern stress and eddy current losses.
- Reduces motor noise, vibration and heat.
- Meets AS/NZ 61000.3.6 standards and IEEE519 recommendations. Complies with IEC 60034-17* and NEMA-MG1 requirements for general purpose motors.
- Available in 690V.

Technical Specifications

Nominal operating voltage	3x480 VAC
Rated operating voltage	3x525 VAC
Overload capability	1.5× rated current for 1 minute, once per hour
Motor frequency	0...70 Hz (up to 200Hz with derating)
Rated currents	4.5 to 1200 A @ 45°C
Motor cable length	Up to 2,000 m (contact Fuseco)
Impedance (uk)	8 to 10% @ 400 V, 50 Hz and rated current
Residual ripple voltage	< 5%
High potential test voltage	P –> E 3000 VAC, 1 minute P –> P 2500 VAC, 1 minute
Protection category	IP 00 (FN 5040) IP 20 (FN 5045)

schaffner

Typical motor power [kW]
Rated current [A]

OUTPUT FILTERS AND LOAD REACTORS	max voltage	Typical motor power [kW]	Rated current [A]	features: dv/dt restriction	Overvoltage restriction	Motor temperature reduction	Red. acoustic motor noise	Sym. sinusoidal output signal	Asym. sinusoidal output signal	Eliminat. of bearing damage	Replaces cable shields	Connection to dc link required	Improves overall EMC	Reduces equipment downtime	typical applications: Motor drives	Servo drives, torque motors	High-speed motor applications	Appl. with long unshield. cabl.	Retrofit of motor drives
FN 5040 (refer to page 9)	500 VAC	1.1	630	●	●	●	●	●					●	●	●				●
		4.5	1200																
FN 5045 (refer to page 9)	500 VAC	1.1	630	●	●	●	●	●					●	●	●				●
		4.5	1200																
FN 5040 HV	690 VAC	75	1200	●	●	●	●	●					●	●	●				●
		13	1320																

Sine Wave Filter Selection Table

Filter	Rated current @ 45°C/ 50Hz (A)	Rated current @ 45°C/ 100Hz (A)	Typical motor drive power rating @ 400 V* (kW)	Typical motor drive power rating @ 480 V** (kW)	Nominal inductance (mH)	Nominal capacitance (µF)	Capacitance connection	Min. switching frequency (kHz)	Typical power loss*** (W)	Input/Output connections		Weight (kg)
FN 5040-4.5-82	4.5	4.05	1.1/1.5	1.3/1.8	13	2.2	Y	4	65	-82		3.3
FN 5040-8-82	8	7.2	2.2/3	2.64/3.6	6.9	4.7	Y	4	80	-82		4.6
FN 5040-10-83	10	9	4	4.8	5.2	6.8	Y	4	90	-83		6.1
FN 5040-17-83	17	15.3	5.5/7.5	6.6/9.0	3.1	10	Y	4	115	-83		7.8
FN 5040-24-84	24	21.6	11	13.2	2.4	10	Y	4	150	-84		14.4
FN 5040-38-84	38	34.2	15/18.5	18/22.2	1.6	10	Y	4	170	-84		25
FN 5040-48-85	48	43.2	22	26.4	1.1	14.7	Y	4	260	-85		33
FN 5040-62-86	62	55.8	30	36	0.85	30	Y	3	280	-86		36
FN 5040-75-87	75	67.5	37	44.4	0.75	30	Y	3	330	-87		42
FN 5040-115-87	115	103.5	45/55	52.8/66	0.5	20	△	3	500	-87		68
FN 5040-180-99	180	162	75/90	90/108	0.3	33	△	3	680		-99	86
FN 5040-260-99	260	234	110/132	132/158.4	0.2	47	△	3	880		-99	125
FN 5040-410-99	410	369	160/200	192/240	0.13	66	△	3	1100		-99	184
FN 5040-480-99	480	432	250	300	0.11	94	△	3	1350		-99	235
FN 5040-660-99	660	594	315/355	378/426	0.14	141	△	2	2000		-99	310
FN 5040-750-99	750	675	400	480	0.12	165	△	2	2800		-99	470
FN 5040-880-99	880	792	400/500	480/600	0.11	188	△	2	3400		-99	640
FN 5040-1200-99	1200	1080	560/630	672/756	0.075	282	△	2	3800		-99	680
FN 5045-4.5-44	4.5	4.05	1.1/1.5	1.3/1.8	13	2.2	Y	4	65	-44		4.1
FN 5045-8-44	8	7.2	2.2/3	2.64/3.6	6.9	4.7	Y	4	80	-44		5.4
FN 5045-10-44	10	9	4	4.8	5.2	6.8	Y	4	90	-44		6.9
FN 5045-17-33	17	15.3	5.5/7.5	6.6/9.0	3.1	10	Y	4	115	-33		9
FN 5045-24-33	24	21.6	11	13.2	2.4	10	Y	4	150	-33		15.6
FN 5045-38-33	38	34.2	15/18.5	18/22.2	1.6	10	Y	4	170	-33		18.9
FN 5045-48-34	48	43.2	22	26.4	1.1	14.7	Y	4	260	-34		35.8
FN 5045-62-34	62	55.8	30	36	0.85	30	Y	3	280	-34		37.8
FN 5045-75-35	75	67.5	37	44.4	0.75	30	Y	3	330	-35		60
FN 5045-115-35	115	103.5	45/55	52.8/66	0.5	20	△	3	500	-35		70
FN 5045-180-99	180	162	75/90	90/108	0.3	33	△	3	680		-99	92
FN 5045-260-99	260	234	110/132	132/158.4	0.2	47	△	3	880		-99	131
FN 5045-410-99	410	369	160/200	192/240	0.13	66	△	3	1100		-99	198
FN 5045-480-99	480	432	250	300	0.11	94	△	3	1350		-99	243
FN 5045-660-99	660	594	315/355	378/426	0.14	141	△	2	2000		-99	425
FN 5045-750-99	750	675	400	480	0.12	165	△	2	2800		-99	482
FN 5045-880-99	880	792	400/500	480/600	0.11	188	△	2	3400		-99	652
FN 5045-1200-99	1200	1080	560/630	672/756	0.075	282	△	2	3800		-99	692

* General purpose four-pole (1500 r/min) AC induction motor rated 400 V/50 Hz.
** General purpose four-pole (1500 r/min) AC induction motor rated 480 V/50 Hz.
*** Exact value depends on the motor cable length and type, switching frequency and further stray parameters of the system.

Required drive settings

Ensure the drive's switching frequency is set to the required minimum switching frequency (refer to selection table above). The mode of operation must be "scalar" (V/Hz) with a fixed switching frequency. Check the drives manufacturer manual whether special settings are necessary. In any doubt contact the drives manufacturer. CAUTION: If the motor drives settings are not correct the filter may be damaged.

FUSECO

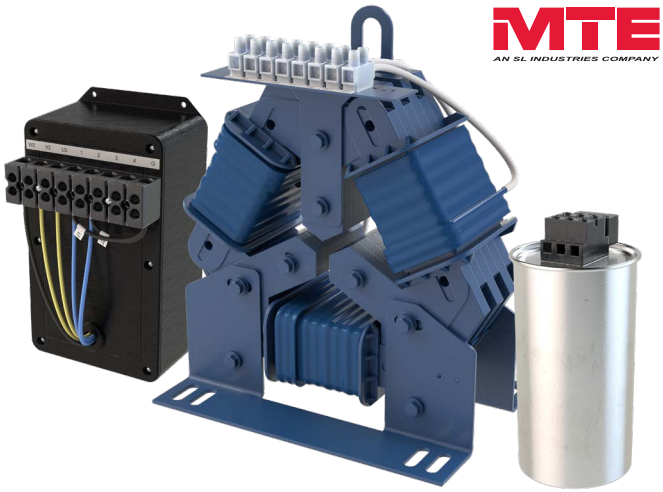
MTE SineWave Nexus™ Filters

An Optimal Integrated Solution for both Differential and Common Mode Filtering

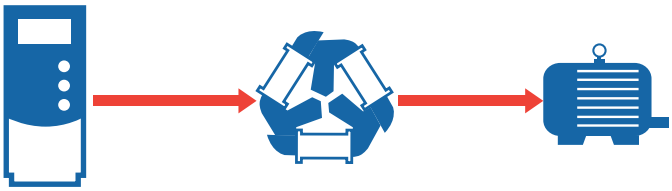
MTE's SineWave Nexus™ filter combines the performance of a sinewave filter with their patented common mode protection technology into a single passive device. It cleans the PWM waveform generated by a VSD and virtually eliminates common mode voltage which causes motor bearing failures. By filtering out the damaging common mode voltage, motor bearings are never subjected to those harmful voltages that cause pitting, frosting, or fluting damage that leads to motor failure.

Key Features:

- Reduces Common Mode voltage to zero
- Increases motor life
- Eliminates motor failures due to bearing currents
- Reduces motor noise and heating
- Protects motor cable
- Small Package Solution
- 3 year warranty (industry leading)



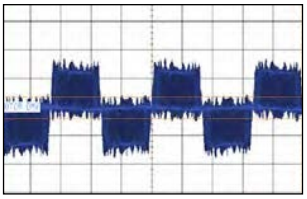
Application Configurations



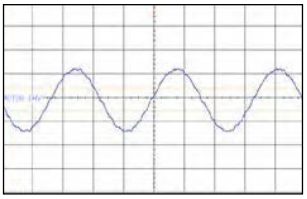
VFD | **SineWave Nexus™** Filters | Motor

SineWave Nexus Performance

Total Harmonic Voltage Distortion

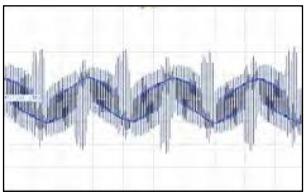


Without SineWave Nexus

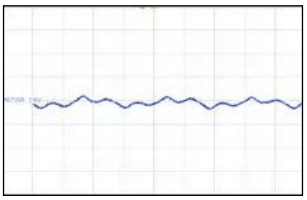


With SineWave Nexus

Common Mode Voltage

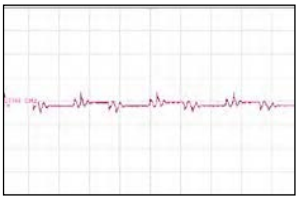


Without SineWave Nexus

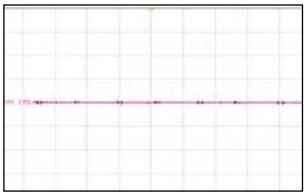


With SineWave Nexus

Common Mode Current



Without SineWave Nexus



With SineWave Nexus

Performance Specifications

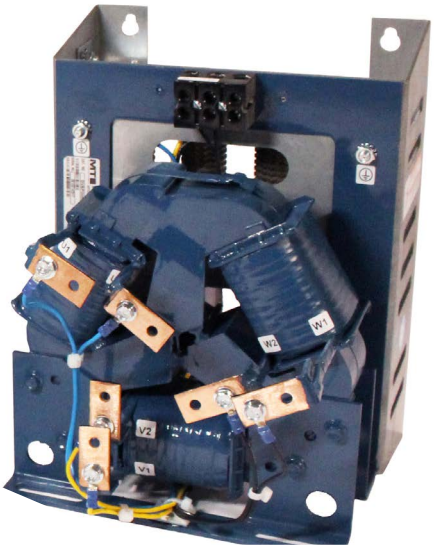
Input Voltage	380V - 600V +/- 10%; 60Hz
Current Range	2A - 160A (0.75 HP - 125 HP)
Harmonic Voltage Distortion	5% maximum @ 4-8kHz
Inverter Switching Frequency	2kHz to 8kHz
Inverter Operating Frequency	6Hz to 75Hz; >75Hz to 120Hz with derating
Insertion Loss (Voltage)	10% maximum @ 60Hz
Efficiency	>98%
Common Mode Attenuation	-20dB (>90% PWM common mode RMS voltage reduction) @ 4-8kHz
Maximum Sound Level	75dB @ 1 meter
Maximum Ambient Temperature	-40C to +60C modular filter -40C to +55C enclosed filter -40C to +90C storage
Altitude Without Derating	3,300 feet above sea level
Maximum Motor Lead Length	15,000 feet
Relative Humidity	0% to 95% non-condensing
Current Rating	100% RMS continuous; 150% for 1 minute intermittent

MTE dV Sentry™ dV/dT Filters

The future is here.

MTE's latest technological innovation has made the dV Sentry™ the revolutionary solution for motor protection. With its patented design, the dV Sentry™ is the first proven filter that provides common mode reduction, peak voltage protection and rise time reduction – all in one unit. This gives greater motor protection over time.

It features a small footprint and easy terminations to make installation faster and easier. It also runs quietly and radiates less heat than previous filters. The unique design of the dV Sentry™ allows for greater load side protection from voltage spikes and common mode voltage for your AC motors, cable and VFDs.



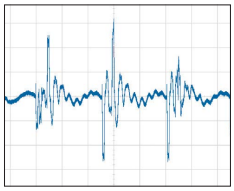
Key Features:

- **Patented design**
  Revolutionary new design provides over 50% common mode reduction, peak voltage protection, and rise time reduction - all in one filter.
- **Low watts loss**
  Reduces radiated heating in systems.
- **Small footprint**
  The dV Sentry's unique flat design, allows the filter to be easily integrated.
- **Strong robust design**
  Allows the filter to withstand challenging installation applications and other difficult environments.
- **Runs quieter**
  Unlike other 'noisy' filters in this class, the dV Sentry™ runs quieter - comparable to a normal conversation.
- **3 year warranty (industry leading)**

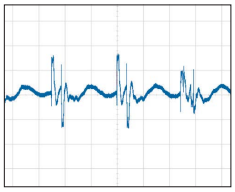
Performance Specifications

Input Voltage	380V – 600V
Current Range	3A – 600A
Available form factors	Panel NEMA 1/2 NEMA 3R
Max Peak motor Voltage	150% of DC bus voltage at 1000 feet
Rise Time	Less than 0.1uS
Insertion Loss	No more than 1.7% at 60Hz No more than 2.6% at 90Hz
Intermittent Current Ratings	150% continuous RMS (1 minute) 200% continuous RMS (10 seconds)
Carrier Frequency Range	3A – 110A: 900Hz – 10kHz (up to 14Khz with derating) 130A – 600A: 900Hz – 5kHz
Motor Frequency	Up to 90Hz without de-rating Up to 120Hz with de-rating
Agency Apporvals	UL, cUL, CE, and RoHS
Motor Audible Noise	Less thank 65dB
Service Temperatures	–40°C to 50°C Enclosed –40°C to 60°C Open
Warranty	3 years from the date of shipment

Common Mode Reduction

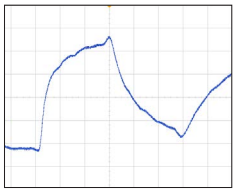


Without dV Sentry™

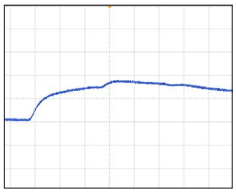


With dV Sentry™

Peak Rise Protection

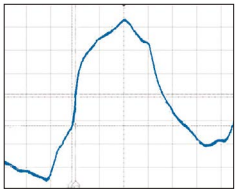


Without dV Sentry™

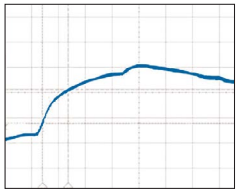


With dV Sentry™

Rise Time Reduction



Without dV Sentry™



With dV Sentry™

FUSECO

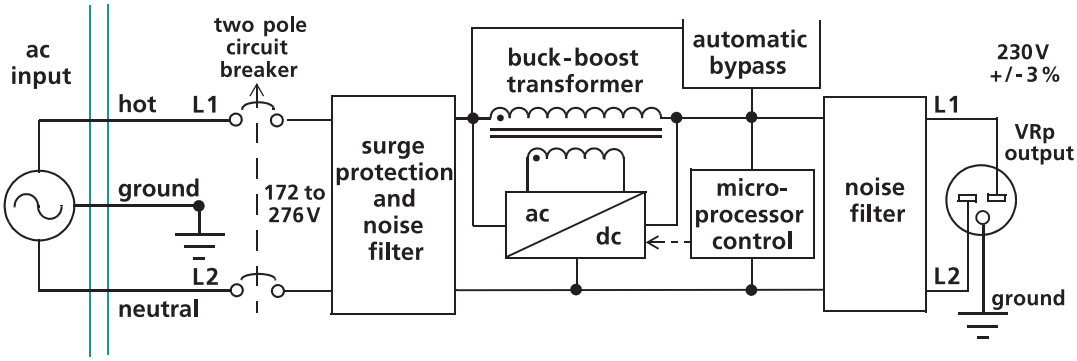
TSI Automatic Voltage Regulators

TSi Power's VRP & VRX range of automatic voltage regulators have a wide input range and precise regulation. Indoor AVR's are ideally suited to protecting sensitive equipment such as laboratory analysers, medical imaging systems & security scanners. Outdoor AVR's are ideally suited to end-of-line voltage correction. The TSi Power range features heavy duty electronics and magnetics designed to operate under worst case conditions. They incorporate industrial strength surge protection, unique AC-chopper technology for very high efficiency and complete line conditioning.

Key Features:

- VRX: Under normal input range of 172-276VAC (47-63Hz), output regulation will be 276VAC (±3%).
- VRP: Under normal input range of 184-287V for 230V with output regulated to ±3%.
- VRX range incorporates an aluminium enclosure that is rain tested to UL 50E / NEMA 3R.
- Complete line conditioning.
- The extended input voltage range is 160-330V with reduced regulation.
- 96-98% efficiency
- Fail-safe. No switching of the power path.
- Fast regulation & automatic bypass.
- Low impedance, low weight & quiet operation.
- 2 year limited warranty.

VRP/VRX System Architecture



VRP Single Phase 230V

- Available in 3, 5, 7.5, 10, 15 and 20 kVA
- Over/under voltage cut-off is available as an option
- Control PCB assembly is designed for easy replacement

VRP Three Phase 230/400V

- Available in 9, 15, 22.5, 30 and 45 kVA
- Other sizes are available upon request
- Over/under voltage cut-off is available as an option
- Control PCB assembly is designed for easy replacement

VRX Three Phase 230/400V

- Available in 15, 22.5 and 30kVA
- Ambient operating temperature range –20°C to +50°C
- Other sizes are available upon request
- Over/under voltage cut-off is available as an option
- Control PCB assembly is designed for easy replacement
- Wall mounting is standard. Pad or pole mounting available as an option

VRX Single Phase 230V

- Available in 3, 5, 7.5, 10, 15 and 20 kVA
- Ambient operating temperature range –20°C to +50°C
- Over/under voltage cut-off is available as an option
- Control PCB assembly is designed for easy replacement
- Wall mounting is standard. Pad or pole mounting available as an option

AC Voltage Regulators

A voltage regulator generates a fixed output voltage of a preset magnitude that remains constant regardless of changes to its input voltage or load conditions. Fuseco supplies a large range of Voltage Regulators to suit virtually every application. Contact the team at Fuseco to discuss your requirements.

Performance Specifications

Single Phase	500VA – 200kVA (Other ratings available upon request)
Three Phase	20kVA – 4,000kVA (Other ratings available upon request)
System Frequency	50/60Hz
Input Voltage	Single phase: 220, 230 or 240V selectable Three phase: 380, 400 or 415V selectable
Input Variation	Single phase: 140-270VAC selectable Three phase: ± 20%, 30% or 40% selectable
Output Accuracy	Single phase: ±3% Three phase: ±2-5% (adjustable)
Efficiency	Single phase: ≥90% Three phase: ≥95%
Adjusting time	≤1.5s (when input voltage within the change of 10%
Wave distortion	No additional wave distortion
Overload capability	2 times rated current, for 1 min
Bypass function	Manual or Automatic
Control	Manual or Automatic
Display	Input Voltage / Output Voltage / Input Current
Insulation resistance	≥2MΩ
Electrical strength	2000VAC for 1min without breakdown or flash over
Ambient temperature	-15°C to +40°C
Humidity	≤90%
Altitude	≤1000m

Key Features:

- Single phase unit: Under normal input range of 140-270VAC (50/60Hz), output regulation will be 220, 230 or 240VAC (±3%).
- Three phase unit: Under normal input range of 380, 400 or 415V ± 20%, 30% or 40% selectable. With output regulated to ±2 to 5% adjustable.
- Optional split-phase regulating
- No additional waveform distortion
- Protection: Over-voltage, over-current, phase failure and phase sequence
- Single phase ≥90%; Three phase ≥95% efficiency
- Fast regulation with manual or automatic bypass options.
- Automatic or manual start selectable
- Low impedance, low weight & quiet operation
- ≤1.5s Adjusting time
- 1 year factory warranty

SBW DBW

SVC

FUSECO

Single-Phase RFI & DC Filters

Single-phase filters for chassis or DIN-rail mounting are key for EMC compliance of higher power office equipment and low to medium power industrial applications. A broad selection of electrical and mechanical features allows a specific choice and deployment for countless applications. DC filters are specifically optimised for applications with DC supply like e.g. PV inverters.

SCHAFFNER

SINGLE PHASE FILTERS	Max voltage	Attenuation performance / Rated current [A] (standard / high / very high; 0 20 40 60 80 100)	Features									Typical applications						
			1-stage filter circuit	2-stage filter circuit	3-stage filter circuit	For DC applications	With overvoltage protection	Low frequency attenuation	High frequency attenuation	Choice of connection style	DIN-rail mounting	Power supplies, SMPS	Medical equipment	Single-phase motor drives	Control unit in machine tools	PV inverters	Office, test & measure. equip.	General purpose
FN 332	250 VAC	1-10	●				●											●
FN 350	250 VAC	8 – 55	●									●		●			●	
FN 2010 (see page 168)	250 VAC	1 – 60	●							●			●					●
FN 2020 (see page 168)	250 VAC	1 – 60	●							●			●				●	●
FN 2030 (see page 168)	250 VAC	1 – 30	●				●	●	●	●			●				●	●
FN 2200	1200 VDC	25 – 2300	●			●		●	●			●				●		●
FN 2210 **FN 2211**	1000 VDC	250-2300	●			●		●	●			●				●		●
FN 2210 HV **FN 2211 HV**	1500 VDC	250-2300	●			●		●	●			●				●		●
FN 2410 (see page 168)	250 VAC 520 VAC (H)	8 – 100	●					●				●		●				
FN 2412	250 VAC 520 VAC (H)	8 – 45	●					●			●	●		●	●			
FN 2450	250 VAC	1 – 20	●					●	●			●	●				●	●
FN 2415 (see page 169)	250 VAC	6 – 16		●				●	●			●	●		●		●	●

SCHAFFNER

SINGLE-PHASE FILTERS	Max voltage	Rated current [A]	Features									Typical applications						
			1-stage filter circuit	2-stage filter circuit	3-stage filter circuit	With earth line choke	With overvoltage protection	Low frequency attenuation	High frequency attenuation	Choice of connection style	TEMPEST protection	Power supplies, SMPS	Medical equipment	Single-phase motor drives	Control unit in machine tools	Interception protection	Office, test & measure. equip.	General purpose
FN 343	250 VAC	1-10		●		●											●	●
FN 2060 (see page 169)	250 VAC	1–30		●						●		●	●				●	●
FN 2070 (see page 169)	250 VAC	1–36		●					●	●		●	●	●			●	
FN 2080	250 VAC	1–16		●				●		●		●	●	●				
FN 2090 (see page 169)	250 VAC	1–30		●			●	●	●	●		●	●	●				
FN 700Z	250 VAC	6–20			●		●	●	●		●	●	●			●	●	
FN 352Z	250 VAC	6–30			●		●		●		●	●			●	●	●	

Attenuation performance
Rated current [A]
standard
high
very high
0 20 40 60 80 100

Single-Phase RFI Filters

FN 2010
250VAC

SCHAFFNER

FUSECO PART NUMBER	RATED CURR @40°C (25°C) (A)	LEAKAGE CURR @ 250VAC/50Hz (mA)	POWER LOSS @25°C/DC (W)	INDUCTANCE L (mH)	CAPACITANCE CX (µF)	CAPACITANCE CY (nF)	RESISTANCE R (KΩ)	WEIGHT (kg)
FN 2010-1-06	1 (1.15)	0.66	0.8	12	0.1	4.7	1000	0.065
FN 2010-3-06	3 (3.45)	0.66	1.1	2.5	0.1	4.7	1000	0.065
FN 2010-6-06	6 (6.9)	0.66	1.7	1	0.1	4.7	1000	0.065
FN 2010-10-06	10 (11.5)	0.66	2.5	0.8	0.1	4.7	1000	0.085
FN 2010-12-06	12 (13.8)	0.66	3.6	0.7	0.1	4.7	1000	0.085
FN 2010-16-06	16 (18.4)	0.66	2.5	0.7	0.1	4.7	1000	0.14
FN 2010-20-06	20 (23)	0.66	3.8	0.6	0.1	4.7	1000	0.21
FN 2010-30-08	30 (34.5)	0.79	6.3	0.7	0.47	10	1000	0.47
FN 2010-60-24	60 (69)	0.79	14.7	1	1.5	10	330	1.1

FN 2020
250VAC

SCHAFFNER

FUSECO PART NUMBER	RATED CURR @40°C (25°C) (A)	LEAKAGE CURR @ 250VAC/50Hz (mA)	POWER LOSS @25°C/DC (W)	INDUCTANCE L (mH)	CAPACITANCE CX (µF)	CAPACITANCE CY (nF)	RESISTANCE R (KΩ)	WEIGHT (kg)
FN 2020-1-06	1 (1.15)	0.66	0.8	12	0.15	4.7	1000	0.08
FN 2020-3-06	3 (3.45)	0.66	1.2	2.5	0.15	4.7	1000	0.08
FN 2020-6-06	6 (6.9)	0.66	1.5	1	0.15	4.7	1000	0.08
FN 2020-10-06	10 (11.5)	0.66	2.9	0.8	0.15	4.7	1000	0.085
FN 2020-12-06	12 (13.8)	0.66	3.6	0.7	0.15	4.7	1000	0.085
FN 2020-16-06	16 (18.4)	0.66	2.5	0.65	0.15	4.7	1000	0.14
FN 2020-20-06	20 (23)	0.66	3.8	0.6	0.15	4.7	1000	0.21
FN 2020-30-08	30 (34.5)	0.79	6.3	0.67	0.47	10	470	0.47
FN 2020-60-24	60 (69)	0.79	14.7	1	1.5	10	220	1.1

FN 2030
250VAC

SCHAFFNER

FUSECO PART NUMBER	RATED CURR @40°C (25°C) (A)	LEAKAGE CURR @ 250VAC/50Hz (mA)	POWER LOSS @25°C/DC (W)	INDUCTANCE L (mH)	CAPACITANCE CX (µF)	CAPACITANCE CY (nF)	RESISTANCE R (KΩ)	WEIGHT (kg)
FN 2030-1-06	1 (1.1)	0.31	0.9	20	0.22	2.2	1000	0.058
FN 2030-3-06	3 (3.4)	0.47	2.2	14	0.33	3.3	1000	0.087
FN 2030-4-06	4 (4.5)	0.47	2.9	14	0.33	3.3	1000	0.092
FN 2030-6-06	6 (6.7)	0.66	3.2	8	0.47	4.7	680	0.1
FN 2030-8-06	8 (8.9)	0.66	3.1	8	0.47	4.7	680	0.17
FN 2030-10-06	10 (11.2)	0.66	5.3	8	0.47	4.7	680	0.196
FN 2030-12-06	12 (13.4)	0.79	7.6	4	1	10	330	0.185
FN 2030-16-06	16 (17.9)	0.79	6.1	4	1	10	330	0.225
FN 2030-20-06	20 (22.4)	0.79	4.6	4	1	10	330	0.285
FN 2030-30-08	30 (33.5)	0.79	6	2	1	10	330	0.326

FN 2410
250VAC

SCHAFFNER

FUSECO PART NUMBER	RATED CURRENT @50°C (40°C) (A)	LEAKAGE CURRENT @250 VAC /50 Hz	POWER LOSS @25°C/50Hz (W)	WEIGHT (kg)
FN2410-8-44	8 (8.8)	2.6	2.6	0.4
FN2410-16-44	16 (17.5)	2.6	3.5	0.5
FN2410-25-33	25 (27.4)	2.6	5.5	0.6
FN2410-32-33	32 (35.0)	2.6	5.6	0.7
FN2410-45-33	45 (49.3)	2.6	7.4	0.7
FN2410-60-34	60 (65.7)	2.6	5.5	1.8
FN2410-80-34	80 (87.6)	2.6	9.9	1.8
FN2410-100-34	100 (109.5)	2.6	15.4	1.8

Key Features

Rated currents from 1 to 100A

General purpose filtering performance

schaffner

FN 2415
250VAC

schaffner

FUSECO PART NUMBER	RATED CURR @40°C (25°C) (A)	LEAKAGE CURR @250 VAC/50 Hz (mA)	Power loss (W)	INDUCTANCE L (mH)	CAPACITANCE Cx (µF)	CAPACITANCE Cy (nF)	RESISTANCE R (kΩ)	WEIGHT (kg)
FN2415-6-29	6 (6.6)	7.85	2.2	8	3.3	100	220	0.4
FN2415-10-29	10 (11)	7.85	2.4	4.2	3.3	100	220	0.4
FN2415-16-29	16 (17.5)	7.85	4.3	3	3.3	100	220	0.4

FN 2060
250VAC

schaffner

FUSECO PART NUMBER	RATED CURR @40°C (25°C) (A)	LEAKAGE CURR @250 VAC/50 Hz (mA)	Power loss @25°C/DC (W)	INDUCTANCE L (mH)	CAPACITANCE Cx (µF)	CAPACITANCE Cy (nF)	RESISTANCE R (kΩ)	WEIGHT (kg)
FN2060-1-06	1 (1.2)	0.66	1.6	12	0.22	4.7	1000	0.12
FN2060-3-06	3 (3.5)	0.66	2.2	2.5	0.22	4.7	1000	0.12
FN2060-6-06	6 (6.9)	0.66	3.2	0.97	0.22	4.7	1000	0.12
FN2060-10-06	10 (11.5)	0.66	4.3	0.8	0.47	4.7	470	0.19
FN2060-12-06	12 (13.8)	0.66	6.2	0.58	0.47	4.7	470	0.19
FN2060-16-06	16 (18.4)	0.66	4.4	0.65	0.33	4.7	1000	0.26
FN2060-20-06	20 (23)	0.66	5.3	0.6	1	4.7	220	0.48
FN2060-30-08	30 (34.5)	0.79	9.1	0.6	1	10	220	0.95

FN 2070
250VAC

schaffner

FUSECO PART NUMBER	RATED CURR @40°C (25°C) (A)	LEAKAGE CURR @250 VAC/50 Hz (=)	Power loss @25°C/DC (W)	INDUCTANCE L (mH)	CAPACITANCE Cx (µF)	CAPACITANCE Cy (nF)	RESISTANCE R (kΩ)	WEIGHT (kg)
FN2070-1-06	1 (1.2)	0.66	2.4	22	0.33	4.7	1000	0.19
FN2070-3-06	3 (3.5)	0.66	2.2	9.8	0.47	4.7	470	0.25
FN2070-6-06	6 (6.9)	0.66	3.2	7.8	1	4.7	220	0.45
FN2070-10-06	10 (11.5)	0.66	9.1	4.5	1	4.7	220	0.67
FN2070-12-06	12 (13.8)	0.66	13.1	3.25	1	4.7	220	0.67
FN2070-16-06	16 (18.4)	0.66	9.6	2.8	1	4.7	220	1
FN2070-25-06	20 (23)	0.66	11.6	2	2.2	4.7	220	0.76
FN2070-36-08	30 (34.5)	0.79	13.1	1.23	2.2	4.7	220	0.79

FN 2090
250VAC

schaffner

FUSECO PART NUMBER	RATED CURR @40°C (25°C) (A)	LEAKAGE CURR @250 VAC /50 Hz	POWER LOSS @25°C/DC (W)	INDUCTANCE L (mH)	CAPACITANCE Cx (µF)	CAPACITANCE Cy1 (nF)	CAPACITANCE Cy2 (nF)"	RESISTANCE R (kΩ)	WEIGHT (kg)
FN2090-1-06	1 (1.1)	0.45	1.8	20	0.22	2.2	1	680	0.073
FN2090-3-06	3 (3.4)	0.45	3.7	14	0.33	2.2	1	470	0.158
FN2090-4-06	4 (4.5)	0.45	6.4	14	0.33	2.2	1	470	0.176
FN2090-6-06	6 (6.7)	0.61	7.1	8	0.47	3.3	1	330	0.191
FN2090-8-06	8 (8.9)	0.61	7.7	8	0.47	3.3	1	330	0.33
FN2090-10-06	10 (11.2)	0.61	8.4	8	0.47	3.3	1	330	0.369
FN2090-12-06	12 (13.4)	0.93	12.1	4	1	10	1	220	0.391
FN2090-16-06	16 (17.9)	0.93	10.7	4	1	10	1	220	0.425
FN2090-20-06	20 (22.4)	0.93	8.2	2.7	1	10	1	220	0.53
FN2090-30-08	30 (33.5)	0.93	10.1	1.5	1	10	1	220	0.548

FUSECO

Three-Phase RFI Filters

EMC/EMI filter solutions for industrial applications like motor drives and machine tools. Furthermore, these types of filters are also suitable for mainframe computer systems, large uninterruptible power supplies, medical equipment, wind turbine power stations and a vast array of other three-phase power electronics. LCL filters are used with active infeed converters (AFE) to allow a norm conform grid connection.

SCHAFFNER

Attenuation performance
Rated current [A]
standard | high | very high
0 | 200 | 400 | 600 | 800 | >1000

THREE PHASE FILTERS	Max voltage	Rated current [A]	Features: Multi-stage filter circuit	Safety connector blocks	Busbar connection	Optional protective covers	Standard protective covers	Offering EMC compliance	Low leakage current	LCL Filter for AIC and AIC applications	Reduces ripple currents and voltage disortions	Improves the power quality on the grid side	All LCL components in one package	Typical applications: Inverters, servo drives	Energy regeneration drives	Machinery, machine tools	Industrial automation	General purpose	Power and energy
FN 351	440 VAC 520 VAC (H)	8–280		●				●						●			●	●	
FN 3025	520 VAC	10–50		●			●	●	●					●			●	●	
FN 3026	520 VAC	10–50		●			●	●	●					●			●	●	
FN 3100	520 VAC	35–300		●				●						●	●	●	●		●
FN 3120	520 VAC (H)	25–230		●				●						●	●	●	●		●
FN 3258	480 VAC 520 VAC (H)	7–180		●				●						●		●	●	●	
FN 3268	520 VAC	7–180		●				●	●					●		●	●	●	
FN 3270	520 VAC	10–1000		●	●	●		●						●		●	●	●	●
FN 3287 **FN 3288** (see page 171)	530 VAC	10–160	●	●				●	●					●		●	●	●	
FN 3288 HV	690 VAC	10–160	●	●				●	●					●		●	●	●	
FN 3310 **FN 3311**	520 VAC	250–2300			●			●						●		●	●	●	●
FN 3310 HV **FN 3311 HV**	690 VAC	250–2300			●			●						●		●	●	●	●
FN 3359 (see page 171)	520 VAC 690 VAC (HV)	150–2500	●		●	●		●						●	●	●	●		●
FN 6840	530 VAC	25–380				●				●	●	●	●	●	●	●	●	●	●

Three-Phase RFI Filters

Key Features

schaffner

- Industry standard EMC solution for three-phase PDS filtering
- Slim space-saving book-style housing
- Solid safety connector blocks or optional wire output connections
- Excellent attenuation performance
- HV versions for up to 690VAC
- HVIT versions for IT distribution networks
- P/L versions with low leakage current

FN3287-C26

530VAC

schaffner

FUSECO PART NUMBER	RATED CURR @ 50°C (40°C) (A)	TYPICAL DRIVE POWER RATING (kW)	LEAKAGE CURR @ 530VAC/50Hz (mA)	POWER LOSS @ 25°C (W)	WEIGHT (kg)
FN3287-10-44-C26-R65	10 (11)	5.5	2.2	7.5	0.7
FN3287-16-44-C26-R65	16 (17)	7.5	2.4	9.5	0.8
FN3287-20-33-C26-R65	20 (22)	11	2.5	10	0.9
FN3287-25-33-C26-R65	25 (27)	15	2.5	11.4	1
FN3287-40-33-C26-R65	40 (44)	22	2.5	22.6	1.5
FN3287-50-53-C26-R65	50 (55)	30	2.5	25.5	2.1
FN3287-63-53-C26-R65	63 (69)	37	2.5	32.1	2.2
FN3287-80-34-C26-R65	80 (88)	45	2.7	32.6	3.4
FN3287-100-35-C26-R65	100 (110)	55	2.7	33	4.2
FN3287-125-35-C26-R65	125 (137)	75	2.7	37.5	4.6
FN3287-160-40-C26-R65	160 (175)	90	2.7	38.4	6

FN3288-C21

530VAC

schaffner

FUSECO PART NUMBER	RATED CURR @ 50°C (40°C) (A)	TYPICAL DRIVE POWER RATING (kW)	LEAKAGE CURR @ 530VAC/50Hz (mA)	POWER LOSS @ 25°C (W)	WEIGHT (kg)
FN3288-10-44-C21-R65	10 (11)	5.5	0.4	7.1	0.8
FN3288-16-44-C21-R65	16 (17)	7.5	0.4	10.5	1
FN3288-20-33-C21-R65	20 (22)	11	0.4	10.7	1.2
FN3288-25-33-C21-R65	25 (27)	15	0.4	17.8	1.2
FN3288-40-33-C21-R65	40 (44)	22	0.4	21.6	1.8
FN3288-50-53-C21-R65	50 (55)	30	0.4	29.3	2.5
FN3288-63-53-C21-R65	63 (69)	37	0.4	34.5	2.7
FN3288-80-34-C21-R65	80 (88)	45	0.4	28.8	4.3
FN3288-100-35-C21-R65	100 (110)	55	0.4	36	5.1
FN3288-125-35-C21-R65	125 (137)	75	0.4	42.2	5
FN3288-160-40-C21-R65	160 (175)	90	0.4	46.1	6.6

FN 3359

520VAC

schaffner

FUSECO PART NUMBER	RATED CURR @ 50°C (40°C) (A)	TYPICAL DRIVE POWER RATING (kW)	LEAKAGE CURR @ 520VAC/50Hz (mA)	POWER LOSS @ 25°C (W)	WEIGHT (kg)
FN3359-150-28	150 (164)	75	5.1	24	5.8
FN3359-180-28	180 (197)	90	5.1	34	5.8
FN3359-250-28	250 (250)	132	5.1	49	9
FN3359-320-99	320 (350)	160	5.1	19	10.5
FN3359-400-99	400 (438)	220	5.1	29	10.5
FN3359-600-99	600 (657)	315	5.1	44	11
FN3359-800-99	800 (876)	400	5.3	39	20
FN3359-1000-99	1000 (1095)	560	5.3	60	20
FN3359-1600-99	1600 (1600)	900	5.1	131	17
FN3359-2500-99	2500 (2500)	1320	5.1	300	69

FUSECO

Three-Phase and Neutral Line RFI Filters

Three-phase and neutral line filters are a compact solution for the interference suppression on the mains input of cabinets and control units of equipment, ranging from industrial applications like machine tools to sensitive medical installations.

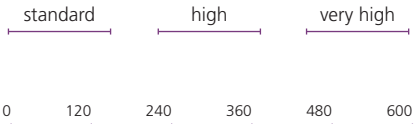
These typically involve separate and often insufficiently filtered frequency inverters and SMPS, causing current imbalance and significant interference problems.

As individual elements they may be interference suppressed already. The conjunction of several switching components in the same cabinet and a non-EMC conscious cabling will rise the demand for an additional RFI/EMI filter on the mains input of the whole installation.

Many times this is the only way to get the CE mark for the cabinet in accordance with the EMC directive.

schaffner

Attenuation performance
Rated current [A]



THREE-PHASE AND NEUTRAL LINE FILTERS	Max voltage	Rated current [A]	Features								Typical applications							
			1-stage filter circuit	2-stage filter circuit	Safety connector blocks	Faston connectors	Offering EMC compliance	For asymmetrical loads	Broadband attenuation	Very low leakage current	For entire systems, install.	Machinery, machine tools	Industrial automation	Power supplies	Medical equipment	For high frequency appl.	High power office equipment	General purpose
FN 354 (see page 173)	440 VAC	4-25		●		●	●		●					●	●	●	●	●
FN 355	440 VAC	3-20	●			●	●			●					●		●	●
FN 356 (see page 173)	440 VAC	16 150	●		●		●	●			●		●	●				
FN 3256H (see page 173)	520 VAC (H)	8 160	●		●		●	●			●	●	●	●			●	●
FN 3280H (see page 173)	520 VAC (H)	8 600		●	●		●	●	●		●	●	●	●				

SCHAFFNER

FN 354
440VAC
SCHAFFNER

FUSECO PART NUMBER	RATED CURRENT @40°C (25°C) (A)	LEAKAGE CURRENT @ 440 VAC/50 HZ (mA)	POWER LOSS @ 25°C/50 HZ (W)	WEIGHT (KG)
FN 354-4-05	4 (4.5)	0.1	2	0.23
FN 354-6-05	6 (6.7)	0.1	3.9	0.38
FN 354-12-05	12 (13.4)	0.1	7.8	1.1
FN 354-15-47	15 (16.8)	0.1	10.8	4.3
FN 354-25-47	25 (28)	0.2	16.9	4.4

FN 356
440VAC
SCHAFFNER

FUSECO PART NUMBER	RATED CURRENT @40°C (25°C) (A)	LEAKAGE CURRENT @ 440 VAC/50 HZ (mA)	POWER LOSS @ 25°C/50 HZ (W)	WEIGHT (KG)
FN 356-16-29	16 (18.4)	0.1	7	1.2
FN 356-25-33	25 (28.8)	0.1	10.1	1.5
FN 356-36-33	36 (41.5)	0.1	10.9	1.6
FN 356-50-33	50 (57.7)	0.1	15.8	2.3
FN 356-100-34	100 (115.0)	0.3	24	5.9
FN 356-150-28	150 (172.5)	1.7	45.9	8.1

FN 3256H
520VAC
SCHAFFNER

FUSECO PART NUMBER	RATED CURRENT @50°C (40°C) (A)	LEAKAGE CURRENT @ 520 VAC/50 HZ (mA)	POWER LOSS @ 25°C/50 HZ (W)	RESISTANCE R (KΩ)	RESISTANCE R1 (kΩ)	WEIGHT (kg)
FN3256H-8-29	8 (8.8)	0.6	2.7	1500	680	0.6
FN3256H-16-29	16 (17.5)	0.6	5	1500	680	0.7
FN3256H-25-33	25 (27)	0.6	9.8	1500	680	1.1
FN3256H-36-33	36 (39)	0.6	11.3	1500	680	1.2
FN3256H-64-34	64 (70)	0.6	17.2	1500	680	2.3
FN3256H-80-35	80 (88)	0.6	14.5	1500	680	3.5
FN3256H-120-35	120 (131)	0.9	25	1500	680	4.7
FN3256H-160-40	160 (175)	1.3	26.9	1500	680	5.7

FN 3280H
520VAC
SCHAFFNER

FUSECO PART NUMBER	RATED CURRENT @50°C (40°C) (A)	LEAKAGE CURRENT @ 520 VAC/50 HZ (mA)	POWER LOSS @ 25°C/50 HZ (W)	RESISTANCE R (KΩ)	RESISTANCE R1 (kΩ)	WEIGHT (kg)
FN3280H-8-29	8 (8.8)	10.7	2.7	1500	660	0.8
FN3280H-16-29	16 (17.5)	10.7	6	1500	660	0.8
FN3280H-25-33	25 (27)	10.7	11.6	820	660	1.3
FN3280H-36-33	36 (39)	10.7	14.8	820	660	1.6
FN3280H-64-34	64 (70)	10.7	18.4	820	660	2.7
FN3280H-80-35	80 (88)	10.7	18.9	1000	660	4.1
FN3280H-120-35	120 (131)	10.7	28.5	1000	660	5.9
FN3280H-160-40	160 (175)	10.7	30.7	1000	660	7.9
FN3280H-200-40	200 (219)	10.7	46.8	1000	660	8.5
FN3280H-300-99	300 (328)	42.1	20.3	1000	680	10
FN3280H-400-99	400 (438)	42.1	36	1000	680	10
FN3280H-600-99	600 (657)	42.1	64.8	1000	680	11

FUSECO

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Technology You Can Trust

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FUSECO

Solid Core – Narrow Profile

TU20PS
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TU20PS-30/5	30/5	20x6	18	-	-	0.5
TU20PS-40/5	40/5	20x6	18	-	-	1
TU20PS-50/5	50/5	20x6	18	-	-	1
TU20PS-60/5	60/5	20x6	18	-	1	1.5
TU20PS-75/5	75/5	20x6	18	-	1.5	1.5
TU20PS-100/5	100/5	20x6	18	-	1.5	2.5
TU20PS-125/5	125/5	20x6	18	1.5	2.5	3.75
TU20PS-150/5	150/5	20x6	18	2.5	3.75	5
TU20PS-200/5	200/5	20x6	18	3.75	5	5
TU20PS-250/5	250/5	20x6	18	5	7.5	7.5

TU30PS
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TU30PS-100/5	100/5	30x10	25	-	-	1.5
TU30PS-125/5	125/5	30x10	25	-	-	1.5
TU30PS-150/5	150/5	30x10	25	1.5	2.5	-
TU30PS-200/5	200/5	30x10	25	2.5	3.75	-
TU30PS-250/5	250/5	30x10	25	3.75	5	-
TU30PS-300/5	300/5	30x10	25	3.75	5	-
TU30PS-400/5	400/5	30x10	25	3.75	5	-
TU30PS-500/5	500/5	30x10	25	5	7.5	-
TU30PS-600/5	600/5	30x10	25	5	7.5	-

TU40PS
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TU40PS-150/5	150/5	40x10	30	-	2	-
TU40PS-200/5	200/5	40x10	30	2.5	3.75	-
TU40PS-250/5	250/5	40x10	30	2.5	3.75	-
TU40PS-300/5	300/5	40x10	30	5	5	-
TU40PS-400/5	400/5	40x10	30	5	5	-
TU40PS-500/5	500/5	40x10	30	5	7.5	-
TU40PS-600/5	600/5	40x10	30	5	7.5	-
TU40PS-750/5	750/5	40x10	30	5	7.5	-
TU40PS-800/5	800/5	40x10	30	5	7.5	-

TU50PS
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TU50PS-400/5	400/5	50x10	40	3.75	5	-
TU50PS-500/5	500/5	50x10	40	5	7.5	-
TU50PS-600/5	600/5	50x10	40	7.5	10	-
TU50PS-750/5	750/5	50x10	40	7.5	10	-
TU50PS-800/5	800/5	50x10	40	7.5	10	-
TU50PS-1000/5	1000/5	50x10	40	10	15	-

Solid Core – Narrow Profile

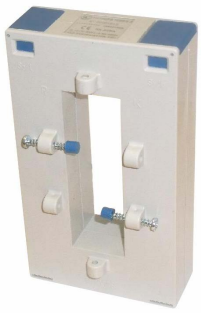
TU60PS
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TU60PS-400/5	400/5	60x10	50	5	5	-
TU60PS-500/5	500/5	60x10	50	5	7.5	-
TU60PS-600/5	600/5	60x10	50	5	7.5	-
TU60PS-750/5	750/5	60x10	50	5	7.5	-
TU60PS-800/5	800/5	60x10	50	7.5	10	-
TU60PS-1000/5	1000/5	60x10	50	10	15	-
TU60PS-1200/5	1200/5	60x10	50	15	20	-
TU60PS-1500/5	1500/5	60x10	50	15	20	-
TU60PS-1600/5	1600/5	60x10	50	15	20	-

TU80PS
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TU80PS-400/5	400/5	80x30	70	5	7.5	-
TU80PS-500/5	500/5	80x30	70	5	7.5	-
TU80PS-600/5	600/5	80x30	70	7.5	10	-
TU80PS-750/5	750/5	80x30	70	7.5	10	-
TU80PS-800/5	800/5	80x30	70	7.5	10	-
TU80PS-1000/5	1000/5	80x30	70	10	15	-
TU80PS-1200/5	1200/5	80x30	70	15	20	-
TU80PS-1500/5	1500/5	80x30	70	15	20	-
TU80PS-1600/5	1600/5	80x30	70	15	20	-
TU80PS-2000/5	2000/5	80x30	70	15	20	-

TU100PS
Single Phase



PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TU100PS-500/5	500/5	100x30	33	5	7.5	-
TU100PS-600/5	600/5	100x30	33	7.5	10	-
TU100PS-750/5	750/5	100x30	33	7.5	10	-
TU100PS-800/5	800/5	100x30	33	7.5	10	-
TU100PS-1000/5	1000/5	100x30	33	10	15	-
TU100PS-1200/5	1200/5	100x30	33	15	20	-
TU100PS-1500/5	1500/5	100x30	33	15	20	-
TU100PS-1600/5	1600/5	100x30	33	15	20	-
TU100PS-2000/5	2000/5	100x30	33	15	20	-
TU100PS-2500/5	2500/5	100x30	33	20	25	-
TU100PS-3000/5	3000/5	100x30	33	20	25	-

TU125PS
Single Phase

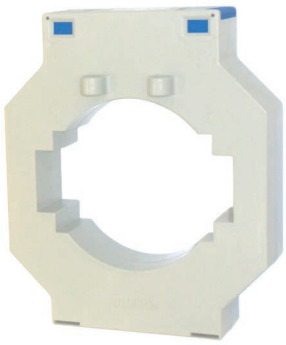
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TU125PS-500/5	500/5	125x50	53	5	7.5	-
TU125PS-600/5	600/5	125x50	53	5	7.5	-
TU125PS-750/5	750/5	125x50	53	7.5	10	-
TU125PS-800/5	800/5	125x50	53	7.5	10	-
TU125PS-1000/5	1000/5	125x50	53	10	15	-
TU125PS-1200/5	1200/5	125x50	53	15	20	-
TU125PS-1500/5	1500/5	125x50	53	15	20	-
TU125PS-1600/5	1600/5	125x50	53	15	20	-
TU125PS-2000/5	2000/5	125x50	53	20	25	-
TU125PS-2500/5	2500/5	125x50	53	20	25	-
TU125PS-3000/5	3000/5	125x50	53	20	25	-
TU125PS-4000/5	4000/5	125x50	53	25	30	-

FUSECO

Solid Core – Narrow Profile & High Accuracy

TU100PSH

Single Phase
High Accuracy



				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TU100PSH-400/5	400/5	100x30 / 80x50	85	-	10	-
TU100PSH-500/5	500/5	100x30 / 80x50	85	5	10	-
TU100PSH-600/5	600/5	100x30 / 80x50	85	15	15	-
TU100PSH-750/5	750/5	100x30 / 80x50	85	15	15	-
TU100PSH-800/5	800/5	100x30 / 80x50	85	15	15	-
TU100PSH-1000/5	1000/5	100x30 / 80x50	85	15	15	-
TU100PSH-1200/5	1200/5	100x30 / 80x50	85	15	15	-
TU100PSH-1500/5	1500/5	100x30 / 80x50	85	15	15	-
TU100PSH-1600/5	1600/5	100x30 / 80x50	85	15	15	-
TU100PSH-2000/5	2000/5	100x30 / 80x50	85	15	15	-
TU100PSH-2500/5	2500/5	100x30 / 80x50	85	15	15	-
TU100PSH-3000/5	3000/5	100x30 / 80x50	85	15	15	-
TU100PSH-4000/5	4000/5	100x30 / 80x50	85	15	15	-
TU100PSH-5000/5	5000/5	100x30 / 80x50	85	15	15	-

DIN Rail Accessory

PART NO.	DESCRIPTION
TU-PS-DIN-ACC	DIN Rail Accessory to suit Narrow Profile Current Transformers

Solid Core – Narrow Profile (Three Phase)

TU20PS-3

Three Phase

				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TU20PS-3-30/5	30/5	20x6	18	-	-	0.5
TU20PS-3-40/5	40/5	20x6	18	-	-	1
TU20PS-3-50/5	50/5	20x6	18	-	-	1
TU20PS-3-60/5	60/5	20x6	18	-	1	1
TU20PS-3-75/5	75/5	20x6	18	-	1	1.5
TU20PS-3-100/5	100/5	20x6	18	-	1.25	1.5
TU20PS-3-125/5	125/5	20x6	18	1	1.5	2.5
TU20PS-3-150/5	150/5	20x6	18	1	1.5	2.5
TU20PS-3-200/5	200/5	20x6	18	1.5	2.5	3.75
TU20PS-3-250/5	250/5	20x6	18	2.5	3.75	5

TU30PS-3

Three Phase

				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TU30PS-3-150/5	150/5	30x10	25	-	1.5	-
TU30PS-3-200/5	200/5	30x10	25	-	2.5	-
TU30PS-3-250/5	250/5	30x10	25	-	2.5	-
TU30PS-3-300/5	300/5	30x10	25	2.5	2.5	-
TU30PS-3-400/5	400/5	30x10	25	2.5	2.5	-
TU30PS-3-500/5	500/5	30x10	25	3.75	3.75	-
TU30PS-3-600/5	600/5	30x10	25	5	5	-

FUSECO

Solid Core – High Accuracy

TUC30

Single Phase
High Accuracy

				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TUC30-200/5	200/5	30x10	25	15	20	30
TUC30-250/5	250/5	30x10	25	15	20	30
TUC30-300/5	300/5	30x10	25	15	20	30
TUC30-400/5	400/5	30x10	25	15	20	30
TUC30-500/5	500/5	30x10	25	15	20	30
TUC30-600/5	600/5	30x10	25	15	20	30

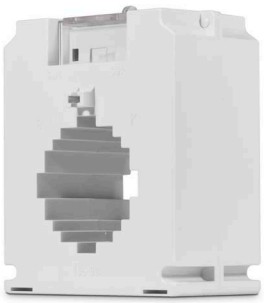
TUC40

Single Phase
High Accuracy

				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TUC40-50/5	50/5	40x10	32	-	0.75	1.5
TUC40-60/5	60/5	40x10	32	-	1.25	2
TUC40-75/5	75/5	40x10	32	-	2	3.75
TUC40-100/5	100/5	40x10	32	1	3	5
TUC40-125/5	125/5	40x10	32	2.5	3.75	5
TUC40-150/5	150/5	40x10	32	3.75	5	7.5
TUC40-200/5	200/5	40x10	32	3.75	5	7.5
TUC40-250/5	250/5	40x10	32	5	7.5	10
TUC40-300/5	300/5	40x10	32	7.5	10	15
TUC40-400/5	400/5	40x10	32	10	15	20
TUC40-500/5	500/5	40x10	32	10	15	20
TUC40-600/5	600/5	40x10	32	10	15	20
TUC40-750/5	750/5	40x10	32	10	15	20
TUC40-800/5	800/5	40x10	32	15	20	30
TUC40-1000/5	1000/5	40x10	32	15	20	30

TUC50

Single Phase
High Accuracy

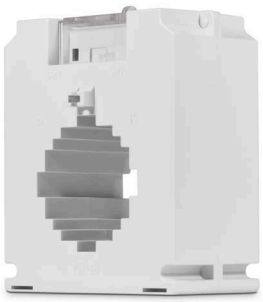


				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TUC50-400/5	400/5	50x10	40	10	-	-
TUC50-500/5	500/5	50x10	40	10	-	-
TUC50-600/5	600/5	50x10	40	10	-	-
TUC50-750/5	750/5	50x10	40	10	-	-
TUC50-800/5	800/5	50x10	40	10	-	-
TUC50-1000/5	1000/5	50x10	40	10	-	-
TUC50-1200/5	1200/5	50x10	40	10	-	-
TUC50-1500/5	1500/5	50x10	40	10	-	-
TUC50-2000/5	2000/5	50x10	40	10	-	-

Solid Core - High Accuracy

TUC60

Single Phase
High Accuracy



				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TUC60-400/5	400/5	60x10	51	15	20	30
TUC60-500/5	500/5	60x10	51	15	20	30
TUC60-600/5	600/5	60x10	51	15	20	30
TUC60-750/5	750/5	60x10	51	15	20	30
TUC60-800/5	800/5	60x10	51	15	20	30
TUC60-1000/5	1000/5	60x10	51	15	20	30
TUC60-1200/5	1200/5	60x10	51	15	20	30
TUC60-1500/5	1500/5	60x10	51	15	20	30
TUC60-2000/5	2000/5	60x10	51	15	20	30

TUC80

Single Phase
High Accuracy

				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TUC80-400/5	400/5	80x30	65	15	20	30
TUC80-500/5	500/5	80x30	65	15	20	30
TUC80-600/5	600/5	80x30	65	15	20	30
TUC80-750/5	750/5	80x30	65	15	20	30
TUC80-800/5	800/5	80x30	65	15	20	30
TUC80-1000/5	1000/5	80x30	65	15	20	30
TUC80-1200/5	1200/5	80x30	65	15	20	30
TUC80-1500/5	1500/5	80x30	65	15	20	30
TUC80-2000/5	2000/5	80x30	65	15	20	30
TUC80-2500/5	2500/5	80x30	65	15	20	30

FUSECO

Split Core

TA30P
Single Phase

				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TA30P-100/5	100/5	30x20	20	-	-	3
TA30P-150/5	150/5	30x20	20	-	-	3.75
TA30P-200/5	200/5	30x20	20	-	2.5	4
TA30P-250/5	250/5	30x20	20	-	3.75	5
TA30P-300/5	300/5	30x20	20	2.5	4	6
TA30P-400/5	400/5	30x20	20	3.75	5	10

TA60P
Single Phase

				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TA60P-250/5	250/5	60x30	30	-	2.5	3.75
TA60P-300/5	300/5	60x30	30	-	3.75	5
TA60P-400/5	400/5	60x30	30	2.5	3.75	7.5
TA60P-500/5	500/5	60x30	30	3.75	5	15
TA60P-600/5	600/5	60x30	30	5	7.5	20
TA60P-750/5	750/5	60x30	30	7.5	10	20
TA60P-800/5	800/5	60x30	30	7.5	10	20
TA60P-1000/5	1000/5	60x30	30	10	15	20

TA80P
Single Phase

				CLASS 0.5	CLASS 1	CLASS 3
PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	VA	VA	VA
TA80P-250/5	250/5	80x50	50	-	2.5	3.75
TA80P-300/5	300/5	80x50	50	-	3.75	5
TA80P-400/5	400/5	80x50	50	2.5	3.75	7.5
TA80P-500/5	500/5	80x50	50	3.75	5	15
TA80P-600/5	600/5	80x50	50	5	7.5	20
TA80P-750/5	750/5	80x50	50	7.5	10	20
TA80P-800/5	800/5	80x50	50	7.5	10	20
TA80P-1000/5	1000/5	80x50	50	10	15	20

Split Core

TA100P
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TA100P-250/5	250/5	100x80	80	-	2.5	3.75
TA100P-300/5	300/5	100x80	80	-	3.75	5
TA100P-400/5	400/5	100x80	80	2.5	3.75	7.5
TA100P-500/5	500/5	100x80	80	3.75	5	15
TA100P-600/5	600/5	100x80	80	5	7.5	20
TA100P-750/5	750/5	100x80	80	7.5	10	20
TA100P-800/5	800/5	100x80	80	7.5	10	20
TA100P-1000/5	1000/5	100x80	80	10	15	20
TA100P-1200/5	1200/5	100x80	80	15	20	30
TA100P-1500/5	1500/5	100x80	80	15	20	30
TA100P-2000/5	2000/5	100x80	80	20	30	45

TA125P
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TA125P-500/5	500/5	125x80	80	-	5	7.5
TA125P-600/5	600/5	125x80	80	-	5	15
TA125P-750/5	750/5	125x80	80	5	10	20
TA125P-800/5	800/5	125x80	80	7.5	10	20
TA125P-1000/5	1000/5	125x80	80	10	20	30
TA125P-1200/5	1200/5	125x80	80	15	20	30
TA125P-1500/5	1500/5	125x80	80	20	30	45
TA125P-2000/5	2000/5	125x80	80	25	30	45
TA125P-2500/5	2500/5	125x80	80	25	30	45
TA125P-3000/5	3000/5	125x80	80	30	45	60

TA160P
Single Phase

PART NO.	AMP RATIO	BUSBAR (mm)	CABLE (mm²)	CLASS 0.5 VA	CLASS 1 VA	CLASS 3 VA
TA160P-500/5	500/5	160x80	80	2.5	3.75	7.5
TA160P-600/5	600/5	160x80	80	3.75	5	10
TA160P-750/5	750/5	160x80	80	5	10	20
TA160P-800/5	800/5	160x80	80	7.5	10	20
TA160P-1000/5	1000/5	160x80	80	10	20	30
TA160P-1200/5	1200/5	160x80	80	15	20	30
TA160P-1500/5	1500/5	160x80	80	20	30	45
TA160P-2000/5	2000/5	160x80	80	25	30	45
TA160P-2500/5	2500/5	160x80	80	25	30	45
TA160P-3000/5	3000/5	160x80	80	30	45	60
TA160P-4000/5	4000/5	160x80	80	30	45	60
TA160P-5000/5	5000/5	160x80	80	30	45	60

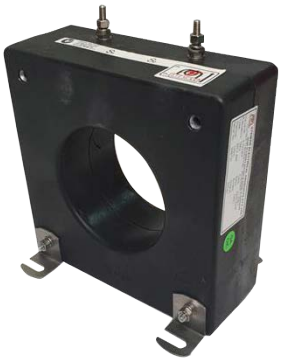
CTs for Littelfuse Protection Relays

EFCT Series

PART NO.	WINDOW ID (mm)	AMP RATIO	TURNS RATIO	MONITORING	wth FLUX CONDITIONER	APPLICATION
EFCT-26	26	5/0.05	100/1	3 Phase & Neutral	yes	EL731, FPU-32, FPS, MPU-32, MPS, SE-330, SE-330AU, SE-701, SE-703
EFCT-1	82	5/0.05	100/1	Neutral	-	
EFCT-1C/WFC	70	5/0.05	100/1	3 Phase	yes	
EFCT-2	140	5/0.05	100/1	3 Phase	yes	

Accuracy: 3% @ 0.01VA

EFCT-RF Series

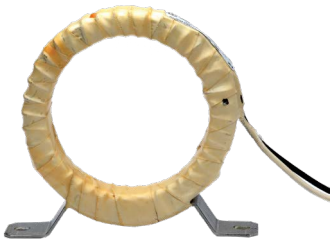


PART NO.	WINDOW ID (mm)	AMP RATIO	TURNS RATIO	ACCESSORY REQUIRED	APPLICATION
EFCT-5RF	60	100/1	100/1	SE-EFVC	EL731, SE-703
EFCT-6RF	85	100/1	100/1		
EFCT-7RF	112	100/1	100/1		
EFCT-8RF	140	100/1	100/1		
EFCT-9RF	160	100/1	100/1		
EFCT-10RF	200	100/1	100/1		

Accessory required: Voltage Clamp

PART NO.	REQUIRED WITH	APPLICATION
SE-EFVC	EFCT-RF CTs	EL731, SE-703

CT200 Series



PART NO.	WINDOW ID (mm)	AMP RATIO	TURNS RATIO	APPLICATION
CT200	56	200/5	40/1	SE-105, SE-107, SE-325
CT200L	89	200/5	40/1	

Accuracy: +/-3% @ rated current,
+/-10% @ 10x rated current: 3% @ 0.01VA

SE-CS10 Series

PART NO.	WINDOW ID (mm)	AMP RATIO	TURNS RATIO	APPLICATION
SE-CS10-2.5	63	12.5/0.0625	200/1	SE-134C, SE-135, SE-145
SE-CS10-4	108	12.5/0.0625	200/1	
SE-CS10-6	160	12.5/0.0625	200/1	
SE-CS10-8	209	12.5/0.0625	200/1	

Accuracy: 1%

CTs for Littelfuse Protection Relays

SE-CS30 Series

PART NO.	WINDOW ID (mm)	AMP RATIO	TURNS RATIO	APPLICATION
SE-CS30-26	26	30/0.05	600/1	FPU-32, FPS, MPU-32, MPS, PGR-6100, SE-704, SE-330AU
SE-CS30-4	95	30/0.05	600/1	
SE-CS30-5	130	30/0.05	600/1	
SE-CS30-70	70	30/0.05	600/1	
SE-CS30-8	200	30/0.05	600/1	

Accuracy: 3% @ 0.06VA

SE-CS40 Series

PART NO.	WINDOW ID (mm)	AMP RATIO	TURNS RATIO	APPLICATION
SE-CS40-6	160	50/0.0625	800/1	SE-135, SE-145

Accuracy: 3% @ 0.04VA

MPU Series

PART NO.	WINDOW ID (mm)	AMP RATIO	CLASS	APPLICATION
MPU/32-100/1	32	100/1	5P10, 1VA	MPU-32, FPU-32
MPU/32-150/1	32	150/1	5P10, 1VA	
MPU/32-200/1	32	200/1	5P10, 1VA	
MPU/32-250/1	32	250/1	5P10, 1VA	
MPU/32-300/1	32	300/1	5P10, 1VA	
MPU/45-100/1	45	100/1	5P10, 1VA	
MPU/45-200/1	45	200/1	5P10, 1VA	
MPU/45-300/1	45	300/1	5P10, 1VA	
MPU/45-400/1	45	400/1	5P10, 1VA	
MPU/45-500/1	45	500/1	5P10, 1VA	
MPU/60-1000/1	60	1000/1	5P10, 1VA	
MPU/60-400/1	60	400/1	5P10, 1VA	
MPU/60-500/1	60	500/1	5P10, 1VA	
MPU/60-600/1	60	600/1	5P10, 1VA	
MPU/60-800/1	60	800/1	5P10, 1VA	
MPU/85-1000/1	85	1000/1	5P10, 1VA	
MPU/85-1200/1	85	1200/1	5P10, 1VA	
MPU/85-1600/1	85	1600/1	5P10, 1VA	
MPU/112-1000/1	112	1000/1	5P10, 1VA	
MPU/112-1200/1	112	1200/1	5P10, 1VA	
MPU/112-1600/1	112	1600/1	5P10, 1VA	

CTs for Littelfuse Protection Relays

DMC/5 Series

PART NO.	WINDOW ID (mm)	AMP RATIO	AXIAL THICKNESS (mm)	CLASS	APPLICATION
DMC45-150/5	45	150/5	60	5P10, 2VA	PGR-8800
DMC45-200/5	45	200/5	60	5P10, 2VA	
DMC45-300/5	45	300/5	60	5P10, 2VA	
DMC45-400/5	45	400/5	60	5P10, 2VA	
DMC45-500/5	45	500/5	30	5P10, 2VA	
DMC45-600/5	45	600/5	30	5P10, 2VA	
DMC60-400/5	60	400/5	30	5P10, 2VA	
DMC60-500/5	60	500/5	30	5P10, 2VA	
DMC60-600/5	60	600/5	30	5P10, 2VA	
DMC60-800/5	60	800/5	30	5P10, 2VA	
DMC85-500/5	85	500/5	30	5P10, 2VA	
DMC85-600/5	85	600/5	30	5P10, 2VA	
DMC85-800/5	85	800/5	30	5P10, 2VA	
DMC85-1000/5	85	1000/5	30	5P10, 2VA	
DMC85-1200/5	85	1200/5	30	5P10, 2VA	
DMC85-1500/5	85	1500/5	30	5P10, 2VA	
DMC112/170-800/5	112/170	800/5	60	5P10, 2VA	
DMC112/170-1000/5	112/170	1000/5	60	5P10, 2VA	
DMC112/170-1200/5	112/170	1200/5	60	5P10, 2VA	
DMC112/170-1500/5	112/170	1500/5	60	5P10, 2VA	

DMC/1 Series

PART NO.	WINDOW ID (mm)	AMP RATIO	AXIAL THICKNESS (mm)	CLASS	APPLICATION
DMC45-150/1	45	150/1	60	5P10, 2VA	SE-330
DMC45-200/1	45	200/1	60	5P10, 2VA	
DMC45-300/1	45	300/1	60	5P10, 2VA	
DMC45-400/1	45	400/1	60	5P10, 2VA	
DMC45-500/1	45	500/1	30	5P10, 2VA	
DMC45-600/1	45	600/1	30	5P10, 2VA	
DMC60-200/1	60	200/1	30	5P10, 2VA	
DMC60-300/1	60	300/1	30	5P10, 2VA	
DMC60-400/1	60	400/1	30	5P10, 2VA	
DMC60-500/1	60	500/1	30	5P10, 2VA	
DMC60-600/1	60	600/1	30	5P10, 2VA	
DMC60-800/1	60	800/1	30	5P10, 2VA	
DMC85-500/1	85	500/1	30	5P10, 2VA	
DMC85-600/1	85	600/1	30	5P10, 2VA	
DMC85-700/1	85	700/1	30	5P10, 2VA	
DMC85-800/1	85	800/1	30	5P10, 2VA	
DMC85-900/1	85	900/1	30	5P10, 2VA	
DMC85-1000/1	85	1000/1	30	5P10, 2VA	
DMC85-1200/1	85	1200/1	30	5P10, 2VA	
DMC85-1500/1	85	1500/1	30	5P10, 2VA	
DMC112/170-800/1	112/170	800/1	60	5P10, 2VA	
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DMC112/170-1200/1	112/170	1200/1	60	5P10, 2VA	
DMC112/170-1500/1	112/170	1500/1	60	5P10, 2VA	

FUSES

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TEST EQUIPMENT

Bringing you the World's Best Brands

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Power Supplies

- Benchtop Power Supplies
- DC Programmable Power Supplies
- AC Programmable Power Supplies
- DC Loads
- AC Loads

Test Equipment

- Vector Network Analysers
- Radio Communication Testers
- Power Quality Analysers
- Spectrum Analysers
- Function Generators
- Spectrum Analysers
- Oscilloscopes
- LCR Meters
- Hi-Pot Testers
- Battery Testers
- Multimeters

EMC

- ESD Simulator Gun
- RF Immunity Test Systems
- Automotive Test Systems
- EMI Receivers
- GTEM Cells
- RF Power Amplifiers
- Solid State Amplifiers
- TWT Amplifiers
- CDN
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- Surge Burst EFT Test Systems

AFJ INSTRUMENTS

AMETEK COMPLIANCE TEST SOLUTIONS

RF/Microwave Amplifiers

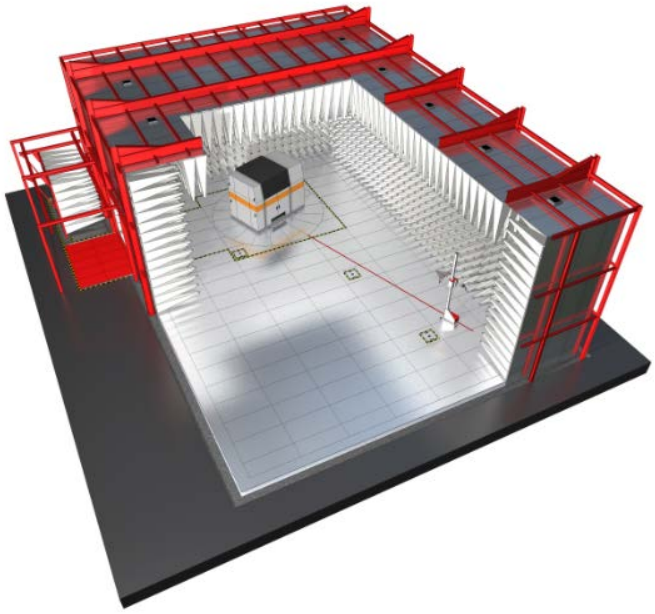
LUMILOOP

MILMEGA RF/Microwave Amplifiers

TESEQ

Anechoic Chamber

- Radiated Emission
- Radiated Immunity
- Conducted Immunity



FRANKONIA

Microwave/mmWave

- Microwave/mmWave
- Signal Generators
- Signal/Spectrum Analysers
- Network Analysers
- Noise Figure Analysers
- Microwave Power Meters
- RF and Microwave Multifunctional Analysers
- Power Amplifiers
- Antenna Testing Systems
- RCS Testing Systems

Ceyear

Opto-Electronic

- Optical Fiber Fusion Splicers
- OTDR's
- Optical Sources
- Optical Power Meters
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Ceyear

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