



Miniature Arc Fault Detection with integral RCBO

THIS SMALL DEVICE **PREVENTS FIRES**



IT PROVIDES HUGE PROTECTION AGAINST ELECTRICAL

AGAINST ELECTRICA FAULTS ON RING CIRCUITS, RADIALS, SPURS & LEADS



LAST YEAR OVER 13,500 FIRES IN THE UK WERE FROM ELECTRICAL ORIGINS



IT FITS NEW AND EXISTING INSTALLATIONS AND COMBINES 3 TECHNOLOGIES



1. MCB TECHNOLOGY WHICH PREVENTS OVERLOAD CURRENTS AND OVERHEATING

2. RCD TECHNOLOGY WHICH PREVENTS ELECTRIC SHOCKS

3. AFDD TECHNOLOGY

WHICH AUTOMATICALLY DISCONNECTS DANGEROUS ELECTRICAL ARCS THAT CAN CAUSE FIRES

71%

OF ELECTRICAL PROFESSIONALS AGREE AFDDS CAN HELP PREVENT ELECTRICAL FIRES

ALL THIS IN A SINGLE COMPACT MODULE



CONTACT ONE OF OUR SALES ENGINEERS TO FIND OUT MORE. WYLEX SINGLE MODULE AFDDS

THE ULTIMATE PROTECTIVE DEVICE





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ARC FAULT DETECTION TECHNOLOGY

Arc fault detection technology offers extremely effective protection against fires that are started by electrical arcing faults. Typical causes include poorly made connections, damaged cables, crushed cables or where damaged or degrading insulation allows current to leak between conductors.

AFD technology detects electrical arcing faults that MCBs and RCDs cannot detect. AFD technology is suitable for use on ring circuits, radial circuits and will protect spurs and leads too.

Single module Miniature AFDD/RCBO provides the highest levels of protection for the installation and its users, do not require larger consumer units and AFDDS can easily be retro fitted into existing installations*.

Types of Arc Fault:

SERIAL ARCING FAULTS:

These are typically caused by a poorly made connection or a damaged conductor. In this arc fault condition current flow is always lower than the operational load current. Miniature circuit breakers and residual current protective devices will not detect these electrical faults.

PARALLEL ARCING FAULTS BETWEEN CONDUCTORS:

These are caused by electric arcs resulting from damage to the insulation that permits minimum contact between the two live conductors. MCBs may trip if the fault current is high enough. However AFD technology is extremely sensitive and will disconnect a parallel arcing fault where the arcing current values may be much lower than the current levels needed for the shutdown conditions of an MCB or Fuse.

PARALLEL ARCING FAULTS BETWEEN PHASE OR NEUTRAL/PROTECTIVE CONDUCTOR:

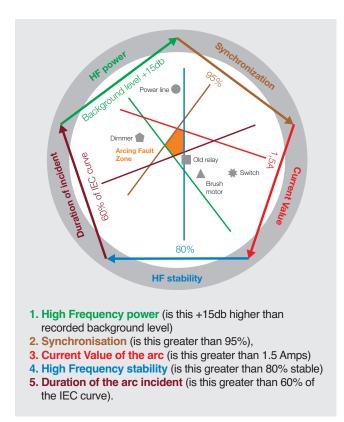
AFD technology will detect arcing faults against the protective conductor and provide adequate fire protection where no RCD is used. However by integrating the AFD technology with 30mA Miniature RCBOs will ensure they reliably detect and shut down this type of parallel arc fault, and provide additional protection against electric shock.



PROVEN TECHNOLOGY - SIEMENS PATENTED SOFTWARE AGAINST "NUISANCE TRIPPING"

Within some electrical equipment 'sparking' occurs during use, for example when switch contacts open or the brushes of an electric motor e.g. commonly found in domestic appliances such as vacuum cleaner, washing machine, dish washer etc. These types of arcs are operational sparking that is expected and controlled within the equipment.

However sometimes unexpected, uncontrolled dangerous arc faults can occur and lead to a fire. The Siemens SIARC patented software has been proven over many years in the USA, it reliably distinguishes between dangerous arc faults (that can cause fires) and the operational sparking of electrical equipment to avoid unwanted/nuisance tripping.



HOW THE SIARC TECHNOLOGY WORKS

The AFDD microcontroller and SIARC software is very sophisticated and analyses a wide range of criteria not only current and voltage, it constantly measures the highfrequency (HF) noise - looking at the intensity, stability duration and the gaps between noise segments, which reliably distinguishes in a fraction of a second a dangerous arc from the rest of the operational sparking.

It achieves this is by using and applying 5 criteria to any detected arc:- See opposite.

The microcontroller within the AFDD is repeatedly making numerous calculations a second. If an arc detection signal doesn't break all 5 of this detection criteria, it doesn't fit into the orange pentagon arcing fault zone and the intelligent decision will not operate the AFDD.

Using the example of an electric motor that creates sparks when it is in use, these sparks only meet 3 out of the 5 criteria:- HF power is greater than +15db back ground level, Synchronisation is greater than 95% and it is greater than 1.5A current value; but there is less than 80% High Frequency stability and less than 60% duration of the IEC curve (3 out of 5) so doesn't cause the AFDD to trip. Only dangerous arcs will be greater than all the 5 detection criteria and this leads to the AFDD to operate and remove the dangerous arc that could lead to a fire.

Single Module Devices

NMX Main Switch Consumer Units



COMBINED AFD/RCBO - WITH SWITCHED NEUTRAL 6kA

		CURRENT	RCD	RCD		
B CURVE	C CURVE	RATING	RATING	TYPE	POLES	MODULE
NXSB06AFD	NXSC06AFD	6A	30mA	А	2	1
NXSB10AFD	NXSC10AFD	10A	30mA	А	2	1
NXSB13AFD	NXSC13AFD	13A	30mA	А	2	1
NXSB16AFD	NXSC16AFD	16A	30mA	А	2	1
NXSB20AFD	NXSC20AFD	20A	30mA	А	2	1
NXSB25AFD	NXSC25AFD	25A	30mA	А	2	1
NXSB32AFD	NXSC32AFD	32A	30mA	А	2	1
NXSB40AFD*	NXSC40AFD	* 40A	30mA	А	2	1
NHXSB40AFD	NHXSC40AF	D 40A	30mA	А	2	2

MINIATURE RCBO - WITH SWITCHED NEUTRAL 6kA

		CURRENT	RCD	RCD		
B CURVE	C CURVE	RATING	RATING	TYPE	POLES	MODULE
NHXS1B06	NHXS1C06	6A	30mA	А	2	1
NHXS1B10	NHXS1C10	10A	30mA	А	2	1
NHXS1B16	NHXS1C16	16A	30mA	А	2	1
NHXS1B20	NHXS1C20	20A	30mA	А	2	1
NHXS1B25	-	25A	30mA	А	2	1
NHXS1B32	NHXS1C32	32A	30mA	А	2	1
NHXS1B40	NHXS1C40	40A	30mA	А	2	1

MINIATURE CIRCUIT BREAKERS 6kA							
		CURRENT					
B CURVE	C CURVE	RATING	POLES	MODULE			
-	NHXLC03	ЗA	1	1			
NHXLB06	NHXLC06	6A	1	1			
NHXLB10	NHXLC10	10A	1	1			
NHXLB16	NHXLC16	16A	1	1			
NHXLB20	NHXLC20	20A	1	1			
NHXLB25	NHXLC25	25A	1	1			
NHXLB32	NHXLC32	32A	1	1			
NHXLB40	NHXLC40	40A	1	1			
NHXLB50	NHXLC50	50A	1	1			

NM ACCESSORIES

CAT REF	PRODUCT	MODULE
NMMB	Metal blanking plate - Twist fit	1
NHB1PP	Blanking plate - Busbar & cover	1
NH00PP	Blanking plate - Twist fit	1
NHET25	25mm Earth Terminal	-
NMLDK	Angled visor locking kit	
NMTLK2	Curved visor locking kit	
MCBLDX	MCB locking device	
WPL	Padlock for NHLDK & MCBLDX	

* Available Year End 2019

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For further information please contact Wylex technical 01543 438320 for availability



MAIN SWITCH - WITH KNOCKOUTS ALL SIDES

	MS	AFD/RCBO	TOTAL	
CAT REF	RATING	WAYS	WAYS	KNOCKOUTS
NMX16	100A	16	16	All sides
NMX20	100A	20	20	All sides

MAIN SWITCH - PLAIN SIDES

		220		
NMX16P	100A	16	16	Rear only
NMX20P	100A	20	20	Rear only

MAIN SWITCH COMPLETE WITH SURGE PROTECTION DEVICE SPD - WITH KNOCKOUTS ALL SIDES

NMX14S	100A	14	14	All sides
NMX18S	100A	18	18	All sides

Consumer Unit Accessories



MAINS TAILS GLAND

CAT REF	PRODUCT
EIU	Moulded cable gland - screw and locknut
	Suitable for 16mm ² or 25mm ² double insulated cable and 16mm ² earth cable
	32mm knockout
NMTG32	Flush 'push fit' moulded cable gland
	Suitable for 16mm ² or 25mm ² double insulated cable and 16mm ² earth cable
	32mm knockout

NMCE1	Membrane cable entries kit 1
	3 x 32mm & 7 x 20mm
NMCE2	Membrane cable entries kit 2
	10 x 20mm



NMX High Integrity Consumer Units



SPLIT LOAD - WITH KNOCKOUTS ALL SIDES

	MS	AFD/RCBO	RCD1	TOTAL	
CAT REF	RATING	WAYS	WAYS	WAYS	KNOCKOUTS
NMXRS14SL	100A	9	9 to 5	14	All sides
NMXRS18SL	100A	11	11 to 7	18	All sides

SPLIT LOAD - PLAIN SIDES

NMXRS14SLP	100A	9	9 to 5	14	Rear only	
NMXRS18SLP	100A	11	11 to 7	18	Rear only	_

SPLIT LOAD COMPLETE WITH SURGE PROTECTION DEVICE SPD - WITH KNOCKOUTS ALL SIDES

NMXRS12SLS	100A	7	7 to 5	12	All sides	
NMXRS16SLS	100A	9	9 to 7	16	All sides	



NMXRS12SSLHI

HIGH INTEGRITY - WITH KNOCKOUTS ALL SIDES

	MS	AFD/RCBO	RCD1	RCD2	TOTAL	
CAT REF	RATING	WAYS	WAYS	WAYS	WAYS	KNOCKOUTS
NMXRS12SSLHI	100A	6	6 to 1	6 to 1	12	All sides
NMXRS16SSLHI	100A	8	8 to 1	8 to 1	16	All sides

HIGH INTEGRITY - PLAIN SIDES

NMXRS12SSLHIP	100A	6	6 to 1	6 to 1	12	Rear only
NMXRS16SSLHIP	100A	8	8 to 1	8 to 1	16	Rear only

HIGH INTEGRITY COMPLETE WITH SURGE PROTECTION DEVICE SPD - WITH KNOCKOUTS ALL SIDES

NMXRS10SSLHIS 100A	5	5 to 1	5 to 1	10	All sides
NMXRS14SSLHIS 100A	7	7 to 1	7 to 1	14	All sides

NM Main Switch Consumer Units

NM Split Load Consumer Units



MAIN SWITCH FIXED

	MS	AFD/RCBO	TOTAL
CAT REF	RATING	WAYS	WAYS
NM206/40	40A	2	2
NM206/63	63A	2	2
NM506L	100A	5	5
NM806L	100A	8	8
NM1106L	100A	11	11
NM1406L	100A	14	14
NM1906L	100A	19	19

FLEXIBLE MAIN SWITCH

NM506FLEX	100A	5	5
NM806FLEX	100A	8	8
NM1106FLEX	100A	11	11
NM1406FLEX	100A	14	14
NM1906FLEX	100A	19	19

FLEXIBLE MAIN SWITCH COMPLETE WITH SURGE **PROTECTION DEVICE SPD**

NM306FLEXS	100A	3	3
NM606FLEXS	100A	6	6
NM906FLEXS	100A	9	9
NM1206FLEXS	100A	12	12
NM1706FLEXS	100A	17	17



NMRS12SLM

SPLIT LOAD FIXED

	MS	AFD/RCBO	RCD	TOTAL
CAT REF	RATING	WAYS	WAYS	WAYS
NMRS2406L	100A	4	2	6
NMRS3306L	100A	3	3	6
NMRS4206L	100A	2	4	6
NMRS5406L	100A	4	5	9
NMRS4506L	100A	5	4	9
NMRS3606L	100A	6	3	9
NMRS6306L	100A	3	6	9
NMRS3906L	100A	9	3	12
NMRS4806L	100A	8	4	12
NMRS6606L	100A	6	6	12
NMRS5706L	100A	7	5	12
NMRS7506L	100A	5	7	12
NMRS8406L	100A	4	8	12
NMRS9306L	100A	3	9	12
NMRS12506L	100A	5	12	17
NMRS11606L	100A	6	11	17
NMRS10706L	100A	7	10	17
NMRS61106L	100A	11	6	17
NMRS71006L	100A	10	7	17
NMRS9806L	100A	8	9	17
NMRS8906L	100A	9	8	17
NMRS51206L	100A	12	5	17

FLEXIBLE SPLIT LOAD

NMRS6SLM	100A	4	2 to 4	6
NMRS9SLM	100A	6	3 to 6	9
NMRS12SLM	100A	9	3 to 9	12
NMRS17SLM	100A	12	5 to 12	17

SPLIT LOAD FIXED WITH TYPE A RCDS

NMRS6606LA	100A	6	6	12

FLEXIBLE SPLIT LOAD WITH TYPE A RCDS

NMRS6SLMA	100A	4	2 to 4	6
NMRS9SLMA	100A	6	3 to 6	9
NMRS12SLMA	100A	9	3 to 9	12
NMRS17SLMA	100A	12	5 to 12	17

FLEXIBLE SPLI	T LOAD WI	ТН 100 <mark>А Т</mark> ҮР	E A RCDS	
NMRS12SL100	100A	9	3 to 9	12
NMRS17SL100	100A	12	5 to 12	17

Flexible busbar has full DIN Rail.



NM Duplex Consumer Units



HIGH INTEGRITY FIXED

HIGH INTEGRITT FIXED							
	MS	AFD/RCBO	RCD1	RCD2	TOTAL		
CAT REF	RATING	WAYS	WAYS	WAYS	WAYS		
NMRS23206L	100A	2	3	2	7		
NMRS44206L	100A	2	4	4	10		
NMRS43306L	100A	3	3	4	10		
NMRS33406L	100A	4	3	3	10		
NMRS76206L	100A	2	6	7	15		
NMRS66306L	100A	3	6	6	15		
NMRS46506L	100A	5	6	5	15		
NMRS55506L	100A	5	5	5	15		
NMRS45606L	100A	6	5	4	15		

FLEXIBLE HIGH INTEGRITY

NMRS66306LA

NMRS7SSLMHI	100A	4	4 to 1	4 to 1	7
NMRS10SSLMHI	100A	5	5 to 2	5 to 2	10
NMRS15SSLMHI	100A	9	9 to 2	9 to 2	15

FLEXIBLE HIGH INTEGRITY WITH SURGE PROTECTION DEVICE SPD

NMRS5SSLMHIS 100A	3	3 to 1	3 to 1	5
NMRS8SSLMHIS 100A	4	3 to 1	3 to 1	8
NMRS13SSLMHIS 100A	8	3 to 1	3 to 1	13

HIGH INTEGRITY FIXED WITH TYPE A RCDS							
NMRS33406LA	100A	4	3	3	10		
NMRS45606LA	100A	6	5	4	15		

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FLEXIBLE HIGH INTEGRITY WITH TYPE A RCDS

100A

NMRS7SSLMHIA 100A	4	4 to 1	4 to 1	7
NMRS10SSLMHIA 100A	5	5 to 2	5 to 2	10
NMRS15SSLMHIA 100A	9	9 to 2	9 to 2	15

FLEXIBLE HIGH INTEGRITY WITH 100A TYPE A RCDS

FLEXIBLE HIG				E A HUDS	
NMRS10HI100	100A	5	5 to 2	5 to 2	10
NMRS15HI100	100A	9	9 to 2	9 to 2	15



NMD1112

DUPLEX UNITS

	MS	AFD/RCBO	TOTAL
CAT REF	RATING	WAYS	WAYS
NMD89	100A	17	17
NMD1112	100A	23	23
NMD1415	100A	29	29
NMD1920	100A	39	39

FLEXIBLE SPLIT LOAD DUPLEX

	TOP I	BANK	BOTTOM BANK		
	MS AFD/RCBO		RCD1	TOTAL	
CAT REF	RATING	WAYS	WAYS	WAYS	
NMDIS88L	100A	8	8	16	
NMDIS1111L	100A	11	11	22	
NMDIS1414L	100A	14	14	28	
NMDIS1919L	100A	19	19	38	

FLEXIBLE HIGH INTEGRITY DUPLEX

		TOP BANK		BOTTOM BANK	
	MS	AFD/RCBO	RCD1	RCD2	TOTAL
CAT REF	RATING	WAYS	WAYS	WAYS	WAYS
NMDRS14SSLHI	100A	5	5 to 1	8	14
NMDRS20SSLHI	100A	6	5 to 1	11	20
NMDRS26SSLHI	100A	10	8 to 1	14	26
NMDRS36SSLHI	100A	16	15 to 1	19	36

		TOP BANK				
	MS	AFD/RCBO	RCD1	RCD2	RCD3	TOTAL
CAT REF	RATING	WAYS	WAYS	WAYS	WAYS	WAYS
NMDRS12HI	100A	6	4 to 2	6 to 2	6 to 2	12
NMDRS18HI	100A	7	5 to 2	7 to 3	7 to 3	18
NMDRS24HI	100A	8	6 to 2	8 to 4	8 to 4	24
NMDRS34HI	100A	10	8 to 2	10 to 5	10 to 5	34

DUAL TARIFF DUPLEX

	TOP BANK		BOTTO		
	MS	AFD/RCBO	MS	AFD/RCBO	TOTAL
CAT REF	RATING 1	WAYS	RATING 2	WAYS	WAYS
NMDIIX88L	100A	8	100A	8	16
NMDIIX1111L	100A	11	100A	11	22
NMDIIX1414L	100A	14	100A	14	28
NMDIIX1919L	100A	19	100A	19	38

DUAL TARIFF DUPLEX

	TOP BANK	BOTTOM BANK	
MS	AFD/RCBO	RCD1	TOTAL
RATING	WAYS	WAYS	WAYS
100A	8	8	16
100A	11	11	22
100A	14	14	28
100A	19	19	38
	RATING 100A 100A 100A	MS AFD/RCBO RATING WAYS 100A 8 100A 11 100A 14	MS AFD/RCBO RCD1 RATING WAYS WAYS 100A 8 8 100A 11 11 100A 14 14

Flexible busbar has full DIN Rail.

AFDDs & THE WIRING REGULATIONS

The 18th edition wiring regulations (BS7671) sets out requirements for electrical installations in the UK, including requirements for protection of persons, livestock & property against the risk from fires that may be generated & propagated in electrical installations.

Designers & installers are required to ensure that installations are arranged so that the risk of ignition from high temperatures or electric arc is minimised, and protection from harmful thermal effects is provided during normal operation and under fault conditions. Protection requirements include protecting against the risk of fire from insulation faults, arcs & sparks & high temperatures ⁽¹⁾.

Installing arc fault detection devices is recommended in the 18th Edition as a method for mitigating the risk from fire in final AC circuits from arc faults.

MCBs, RCDs AND THE SAFETY GAP

Although the wiring regulations permit the use of RCDs as a measure for protection against insulation faults to earth, & require the use of other circuit protection devices such as MCBs to provide protection against short circuit & overcurrent conditions etc, those devices cannot detect or disconnect arc faults. Neither of those devices is capable of detecting any serial arc faults, and parallel arc faults can go unnoticed due to the fact that the magnitude of an arc fault is insufficient to operate an RCD or MCB.

COMBINED TECHNOLOGY - AFDD, MCB + RCD IN ONE MODULE

In order to provide for all of the above requirements Wylex AFD technology is integrated into a single **18mm wide module** protective device that includes overcurrent protection, short circuit fault protection, earth leakage protection, and arc fault protection, with two pole isolation **as standard**.

Wylex AFD technology provides for the requirements of BS7671 including additional protection against fires caused by arcs. Closing the safety gap & providing additional safety measures.





BS 7671 WIRING REGULATIONS 18th EDITION

DEFINITIONS	DANGER Risk of injury to persons from: fire, electric shock, burns, arcing and explosion arising from the use of electrical energy				
CHAPTER 13	PROTECTION FOR SAFETY The requirements are to provide for the safety of persons, livestock and property against dangers that may arise from reasonable use of electrical installations including risks of injury from: shock currents excessive temperatures likely to cause burns, fires and other injurious effects arcing or burning, likely to cause blinding effects, excessive pressure and/or toxic gas				
CHAPTER 13	PROTECTION FOR SAFETY - THERMAL EFFECTS Installations should be arranged so that the risk of ignition of flammable materials due to high temperature or electric arc is minimized and risk of burns should be minimal.				
CHAPTER 42	PROTECTION AGAINST FIRE CAUSED BY ELECTRICAL EQUIPMENT Requires people livestock and property to be protected against harmful effects of heat or fire that may be generated or propagated in electrical installations. Harmful effects from heat or fire may be caused by insulation faults, arcs, sparks and high temperature particles				
CHAPTER 42	PROTECTION AGAINST THERMAL EFFECTS Electrical equipment shall be so selected and erected that its normal temperature rise and foreseeable temperature rise during a fault cannot cause a fire. This shall be achieved by the construction of the equipment or by additional protective measures taken during erection of installation				
CHAPTER 42	PROTECTION AGAINST THERMAL EFFECTS & WHERE TO USE AFDDs Arc Fault Detection Devices are recommended as a means of providing additional protection against fire caused by arc faults in AC final circuits e.g. in buildings with sleeping accommodation, in places with a risk of fire involving stored or processed materials, wooden/combustible buildings, fire propagating structures and premises with endangered or irreplaceable items				
CHAPTER 53	DEVICES FOR THE PROTECTION AGAINST THE RISK OF FIRE - WHERE TO INSTALL Where specified. Arc fault detection devices shall be installed at the origin of the final circuits to be protected, and in AC single phase circuits not exceeding 230V, i.e. in the consumer unit or distribution board. Arc fault detection devices shall comply with BS EN 62606				

(1) For reference - 131.1, 131.3.1, 131.3.2, 420.1, 421.1.1, 422.1.2, 421.1.7, 522.6.1, 522.6.2, 526.1, 532.1, 532.6, Appendix 6 schedule of inspections & schedule of test results. Not exhaustive, other requirements may also apply. Readers should refer to BS 7671 for full details.

ELECTRICAL FIRES

Government statistics for 2017/18 show a high number of incidents where the source of ignition is recorded as electrical distribution or electrical appliance, these two categories amount to more than 13,000 fires in total ⁽²⁾

Year	Total	Electrical distribution	Other electrical appliances	Combined total
2014/15	71,112	7,814	5,833	13,647
2015/16	73,464	7,716	5,637	13,353
2016/17	74,914	7,837	5,537	13,374
2017/18	74,118	7,554	5,516	13,070

(2) Government statistics for England, fire statistics data table 0602

AFDD EXPERIENCE

Arc fault detection technology has been proven to reduce the number of incidents of electrical fires in countries where these devices are used. AFD technology will detect & automatically disconnect arc faults that occur in damaged or crushed cables, in improperly made terminations, and in ageing installations where the insulation quality degrades over time.

Arc faults cause overheating, the temperatures that are created can be at least 6,000 °C, not even the best insulation material can withstand such temperatures which will obviously be high enough to ignite flammable materials and cause fires. The technology monitors the condition of a circuit for unusual conditions that are indicative of a series or parallel arc. These arc fault conditions can occur in electrical installation circuits and in cords & leads and in equipment / appliances connected to those circuits. When the device detects dangerous arc fault conditions it will automatically disconnect the power to the circuit with an arc fault. With the government statistics revealing so many fires involving electrical distribution & appliances the use of AFD technology on final A.C. circuits would address some of these issues, including those associated with cords & leads.

electrium

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Although every effort has been made to ensure accuracy in the compilation of the technical detail within this publication, specifications and performance data are constantly changing. Latest details can be obtained from Wylex.

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