

DX³ STOP ARC

ARC FAULT DETECTION DEVICE

USER
GUIDE



This technical guide for **DX³ STOP ARC** describes the basic rules for selecting, installing and using in proper conditions.

The DX³ STOP ARC must be installed **in accordance with the installation instructions** described in the manuals. If they have suffered any external knocks or blows, do not connect or use the DX³ STOP ARC.

Incorrect installation and use may lead to the risk of electric shock or fire. This product must be used in **normal conditions**, in other words it must not be subjected to any other voltage/current/frequency/temperature values than those specified in the sales catalogue and manual.

Any **modification or repair** which has not been authorized by the Legrand Group voids all liability, replacement rights and warranties. Only use accessories recommended by Legrand.

Wear the necessary **PPE** when working and cut off power on all the installation before working on it.

Any failure to apply **procedures and warnings** can lead to premature failure.

LEGAL INFORMATION

Particular attention must be paid on presentation pictures that do not include personal protective equipment (PPE). PPE are legal and regulatory obligations.

In accordance with its continuous improvement policy, Legrand reserves the right to change the specifications and illustrations without notice. All illustrations, descriptions and technical information included in this document are provided as indications and cannot be held against Legrand.

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PURPOSE OF DX³ STOP ARC

Presentation

DX³ STOP ARC is an Arc Fault Detection Device, as per IEC/EN 62606 standard requirements. It enhances the safety in installations thanks to additional protection against electric faults.

It protects against overloads, short-circuits (and earth leakages for the residual current version) and arc faults which are not detected by usual modular protection devices.



What is an arc fault?

The arc results from a current flowing in the air between two conductors with different potentials, close enough to allow this current to flow between each other.

This is a fault as it only occurs in unusual conditions. For example, when there is a cable deterioration or a loss of electric connection.



Why is it dangerous?

An arc fault produces sparkles or a continuous arc which are, because of overheating, at the origin of the ignition of flammable goods that are in their vicinity. This results in stronger risks of fire.

How does it work?

The AFDD is designed with a microprocessor able to analyze in real time multiple electrical signals and to differentiate the signature:

- of a series of arcs or;
- of a parallel arc fault or;
- of an arc to the earth

from the one of a parasite disturbance in order to preserve the security of the circuit and avoid any unwanted tripping.

The AFDD is immune to unwanted tripping due to frequent non-dangerous arcs that occur in low voltage installations, for example, during the switching of loads by means of contactors or wiring devices, or when using electrical equipment such as drills or vacuum cleaners.

It is developed on the basis of an analysis of multiple types of electrical appliances and various loads available on the market. It does not necessarily prefigure the potential future technical evolutions which may interfere with AFDD detection algorithm and may cause unwanted tripping in some cases.

The identification of dangerous electrical arcs is based on several factors, all of which are analyzed simultaneously:

- Signature or disturbance generated by the arc fault
- Duration of the phenomenon (normal switching operations generate brief arcs)
- Occurrence/regularity of the signal (an electrical motor produces arc currents with constant forms)

Installation

A. COUNTRIES

DX³ STOP ARC shall be installed in compliance with national standards requirements. DX³ STOP ARC is suitable for networks 50 Hz with 230 V between phase and neutral. The range is designed to fulfill countries used to supply the modular devices by the top side as well as countries used to supply the modular devices by the bottom side.



Supply on the top side
Outgoing on bottom side



Supply on the bottom side
Outgoing on top side



B. ENVIRONMENT

As written above, the AFDD is defined as per IEC/EN 62606 standard, whose scope is for residential and similar applications. This means that AFDDs, when they refer to this standard, are not properly designed for other applications, such as industrial environment with harmonic pollution or disturbed networks. The main consequence is that they may not bring the service level expected by the customer because of the parasite signals which increase the risk of unwanted trippings. Legrand do not recommend installing DX³ STOP ARC in such environments.

However, as indicated in the Harmonization Document 60364-4-42 (2014) which rules European countries installation standards, AFDDs can be recommended for buildings others than residential, such as wooden structures constructions, fire propagating structures (skyscrapers), locations where flammable goods are processed or stored (barns), etc.



This harmonization document recommends the use of AFDDs for the protection of socket outlet circuits (16 A which is the usual rated current), but they can be installed for circuits where their high protection level is relevant.



Recommendation in locations with high service continuity level: Legrand do not recommend using of AFDDs for areas where high service continuity level is required.

Selection

DX³ STOP ARC rating and curve should be selected following the same rules as for MCBs, that is to say according the cable cross section and length combined with the nature and the power of the load(s) to supply and the conditional short circuit current at the point of the installation.

The Arc fault detection unit is common to all DX³ STOP ARC AFDDs and does not enter in the product selection parameters. It doesn't have any impact on the attached MCB/RCBO performances: back-up and selectivity data remain unchanged.

DX³ STOP ARC are available in XLPRO software database. Their versions (top side or bottom side supply) can vary from one country to another, to comply with the local wiring rules.

Important:

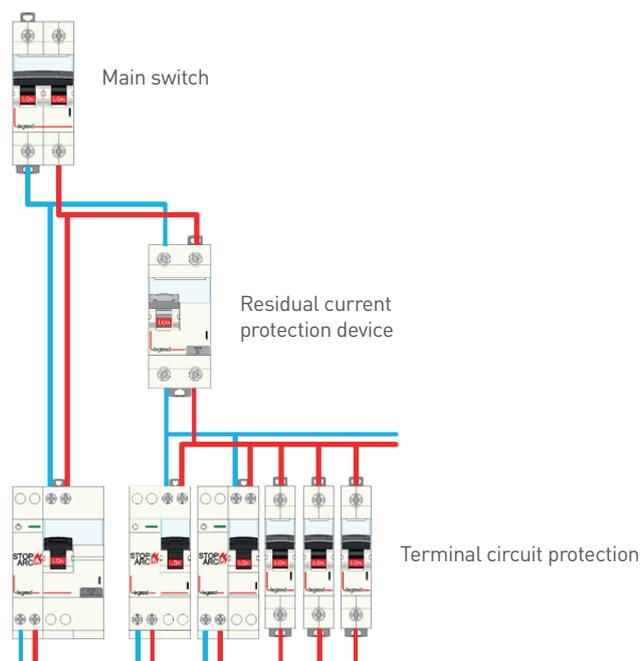
AFDDs are engineered for single phase circuit protection and should not be used at the origin of the installation (as main protection) or as head of multiple MCBs level. This is applicable to both standard and residual current versions.



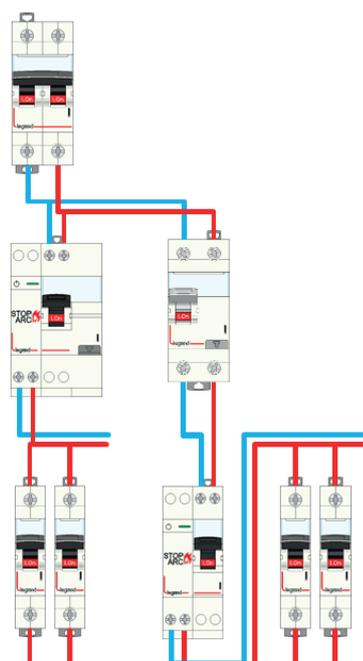
To get more information, please refer to our White Paper, available online.

Installation principle

Example with AFDDs supplied from the top:



Correct use: AFDDs are used to protect single circuits



Incorrect use: AFDDs are used to protect several circuits.



Even if the AFDD is placed downstream of a RCCB, it cannot protect several circuits.

Use

DX³ STOP ARC are designed for convenient integration into any DIN rail cabinet. They can be fixed on standard 35 mm rails and fit perfectly into modular rows.

The wiring should be always done as per instruction manual indications. DX³ STOP ARC power supply is not reversible. As per product standard IEC/EN 62606, the arc fault detection unit is located downstream its associated thermal magnetic protection.

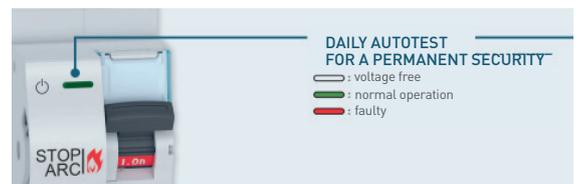
A. AUXILIARIES

DX³ STOP ARC can be fitted with DX³ Auxiliary contacts, Fault Signals, Shunt Trips and Undervoltage Releases. The maximum number of auxiliaries that can be attached is indicated in the technical datasheet.

DX³ STOP ARC can be integrated into Legrand supervision system by the mean of dedicated CX³ EMS auxiliaries.

B. SWITCH ON

DX³ STOP ARC is fitted with a light indicator which displays its status as per the code indicator hereafter.



The autotest consists in a test of the electronic components to check the ability of the AFD unit to detect electric arcs. The autotest occurs every day and every time the AFDD is reclosed (handle in ON position). If the autotest detects an internal fault, the DX³ STOP ARC trips (the handle is triggered in OFF position). After reclosing, a new autotest is carried out. If the fault has disappeared (transient error), the indicator lights green. If the fault is still present, it blinks red. Despite an internal persistent fault, the AFDD can be reclosed to enable an efficient service continuity but the red LED keeps on blinking to warn the operator that the Arc fault detection is no more ensured. Whenever the electronic unit would fail, the thermal magnetic protection will remain operational.

C. TEST IN-SITU

So far, there is no testing equipment developed for the specific purpose of AFDDs which would be available in the market.

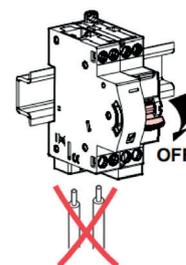
In the absence of such equipment, **manual tests performed by installers on site in order to try to reproduce arc faults should be strictly avoided.** Depending on testing conditions and on the kind of materials employed, these tests would give random results and above all, may endanger the user. Therefore, we do not recommend this kind of practice.

D. INSULATION TEST

In case of insulation test (dielectric test) DX³ STOP ARC should be disconnected on the side(s) where the test is carried out, to prevent its electronic unit from any damage.



Insulation test



DX³

TROUBLESHOOTING

Status of normal use

Product handle	Light	Mechanical indicator STOP ARC	Upstream RCCB	Status
ON	GREEN	NO	NO	Normal operating

Tripping causes

Product handle	Light	Mechanical indicator STOP ARC	Upstream RCCB	Status
OFF	NO	RED	NO	Arc fault tripping
OFF	NO	NO	NO	Overload or short circuit
OFF	NO	NO	YELLOW	Residual current fault
OFF	NO	RED	YELLOW	Both Arc fault tripping and residual current fault

Status of AUTOTEST issue

Product handle	Light	Mechanical indicator STOP ARC	Upstream RCCB	Status
ON	RED (blinking)	NO	NO	Switched on

EVENTS	Indicator light	Mechanical indicator	Possible cause	Actions
The product has tripped (handle in off position)		-	Overload or short circuit	Check your installation according to the potential defect and correct it, then switch on the product
			Manual tripping	Switch on the product
	-	RED	Arc fault	Check your installation according to the potential defect and correct it, then switch on the product
	-	YELLOW	Residual current fault	Check your installation according to the potential defect and correct it, then switch on the product
	-	YELLOW AND RED	Both Arc fault and residual current fault	Check your installation according to the potential defect and correct it, then switch on the product
The product trips when switch-on	-	-	Persistent overload or short circuit	Check your installation according to the potential defect and correct it, then switch on the product
	-	RED	Persistent arc fault	Check your installation according to the potential defect and correct it, then switch on the product
	-	YELLOW	Persistent residual current fault	Check your installation according to the potential defect and correct it, then switch on the product
	-	YELLOW AND RED	Both persistent arc fault and residual current fault	Check your installation according to the potential defect and correct it, then switch on the product

TROUBLESHOOTING

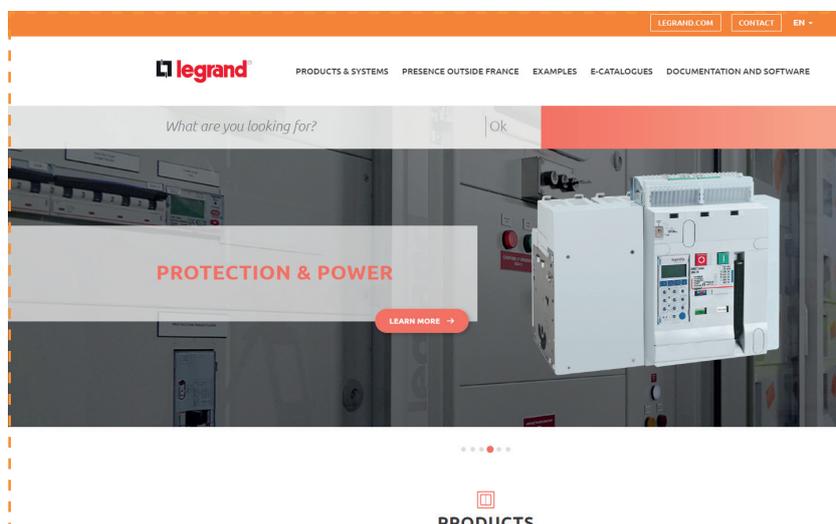
EVENTS	Indicator light	Mechanical indicator	Possible cause	Actions
The product is switched ON and the light indicator is OFF	-	-	No electrical supply	Check if the installation is correctly supplied
			No wire connected	Check if the product is correctly connected
The product is switched ON and the light indicator is blinking red	Blinking red	-	Issue detected by autotest	Product to be replaced
The product emits noise when it is supplied	Green light	-	Normal noise during functioning < 30 dB at 1m	NO
The product trips when it is associated with an undervoltage release	-	-	Undervoltage release is not supplied	Check if the undervoltage release is correctly supplied
Before installation, product has red or yellow indicator	-	RED AND/OR YELLOW	Vibration during transportation	Switch on and switch off the product
The product does not trip although an arc is noticed	GREEN LIGHT	-	Intensity of an arc lower than 2.5 A or too short duration of the arc	Check the installation and take corrective actions if necessary
The product does not hang on DIN rail	-	-	Bi-stable clamps are in open position	Reclose the clamps

To know more,
check [export.legrand.com](https://www.export.legrand.com)

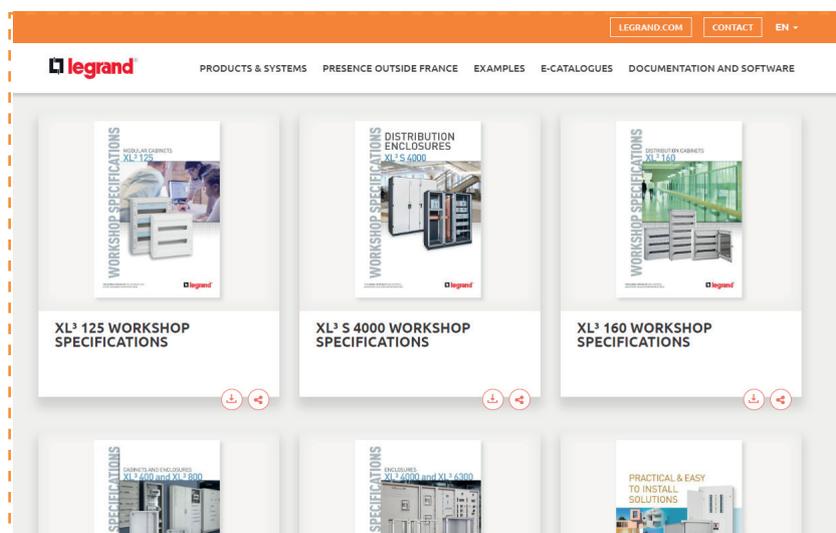


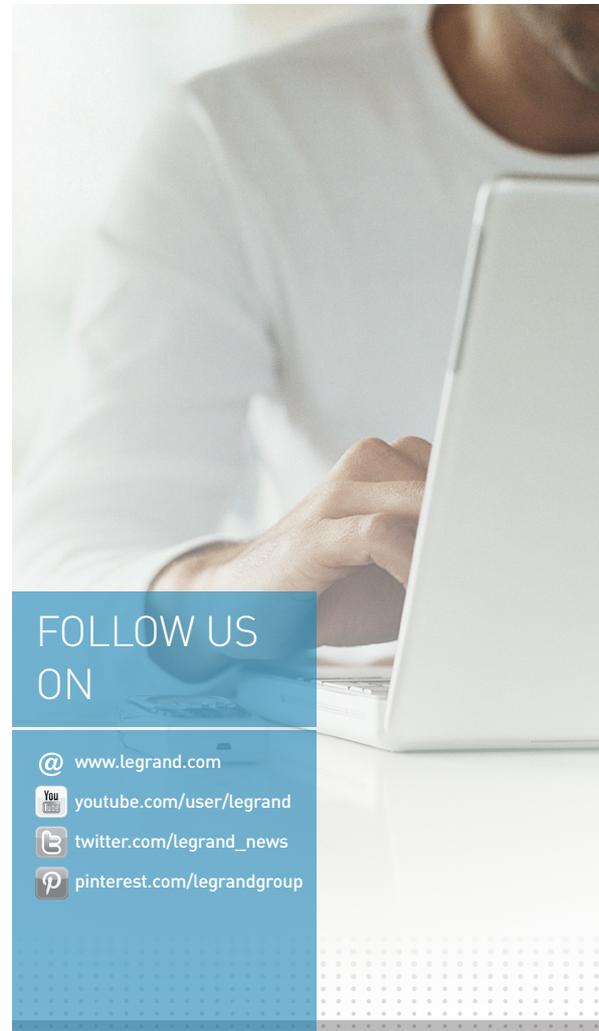
All technical data of the products inside this workshop specifications book are available on : <https://www.export.legrand.com/en>

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