

# FDO A0(A60) Kaasutiivis palopelti



## Overview

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- Type-approved by the most recognized classification societies: class A0 – A60 fire damper when suitably insulated
- Fixed frame of painted, galvanized or stainless steel. Blades stainless or galvanized steel. Flanges available as an option
- The blade contains seals (effective up to 270 °C)
- The nominal fuse release temperature is 50 °C, 74 °C or 100 °C. Other temperatures available
- Very low leakage. See below table
- Automatic electrical, pneumatic or spring operation system available
- Maximum duct pressure for damper construction
- 5000 Pa and maximum air velocity 15 m/s
- The normal operating temperature for the damper is between -50 °C to +80 °C. Actuator and component selection can affect this temperature range. Other temperatures available on request
- Available as ATEX approved
- SIL 2 safety assessment certificate available for the damper on specific terms

## Specification

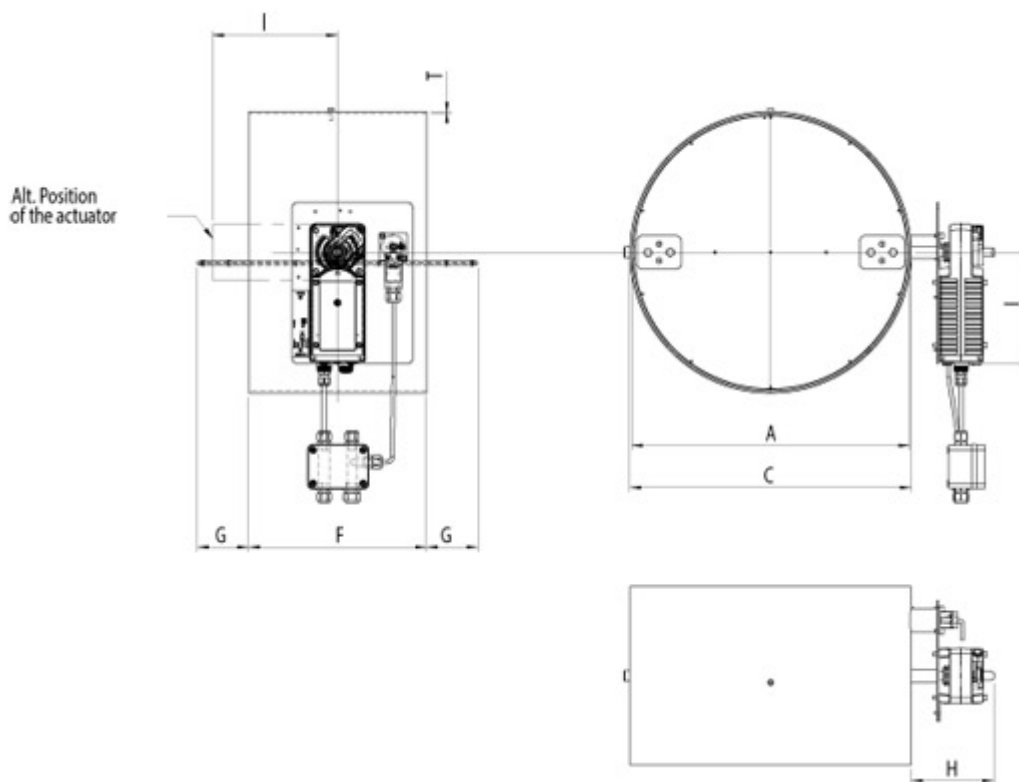
Halton FDO fire dampers are type-approved class A0(A60) fire dampers for use in marine and offshore ventilation systems. The FDO can be installed in circular ducts. All fire dampers have a fusible link and they prevent the spread of fire within ventilation ductwork. When the blade is in the open position, the device does not cause significant pressure loss, noise or flow disturbance. Fire

dampers are set from outside and can be installed in any position. An open-closed indicator is visible on the outside of the damper.

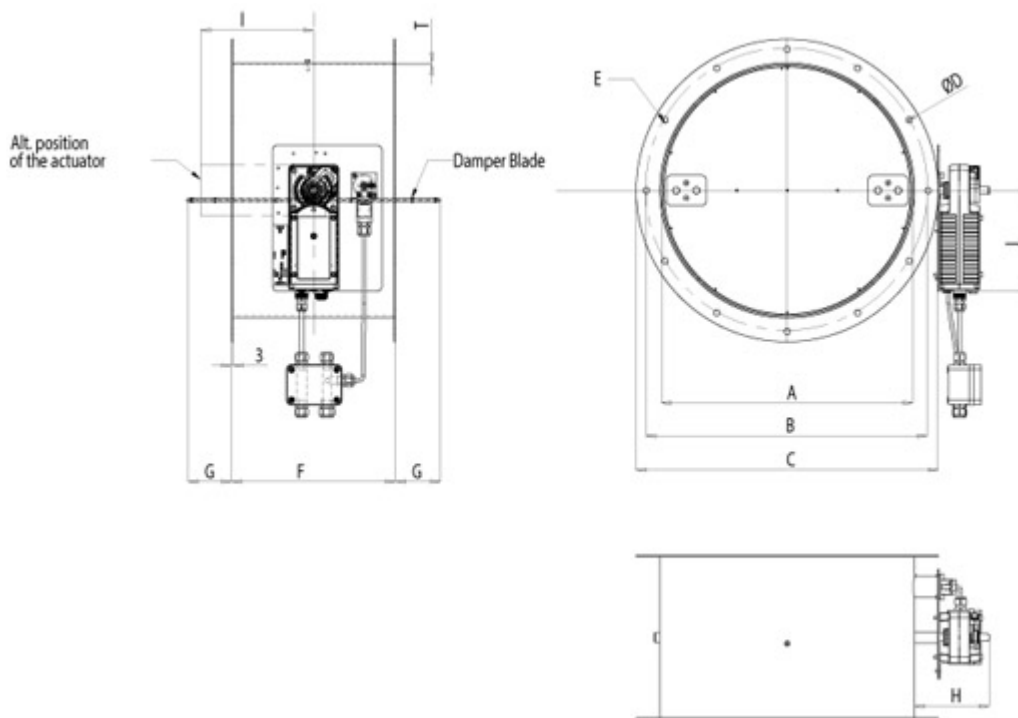
## Dimensions and Material Thickness

FDO fire dampers meet international standards for circular ducts ( $\text{Ø}100\text{-}500$  mm). Sizes  $\text{Ø}100$  and  $\text{Ø}125$  are not available of stainless steel. Sizes starting from  $\text{Ø}160$  can be manufactured with 1 mm division. Flanges and drilling available as an option and according to ISO 15138 standards. Special flanges and drilling available on request. Frame material thickness 3 mm or according to SOLAS. Flap is made of two sheets, each of them being 1 mm thick (riveted together).

### General FDO drawing (without flanges)



## General FDO drawing (with flanges)



## FDO dimensions without flanges (standard)

Damper size	Inside dimensions	Outside dimensions	Material thickness	Housing Left	Blade	FDO-EL				FDO-PNR		
						Eledrive CSQP / Schischek		Belimo BF		Air Torque AT50		Air Torq AT10
Ø	A	C	T	F	G	H	I	H	I	H	I	H
100	100,8	108	3,6	200	–	150	200	115	200	145	215	165
125	125	133	4	200	–	150	200	115	200	145	215	165
160	160	166	3	200	–	150	200	115	200	145	215	165
200	200	206	3	320	–	150	200	155	200	145	215	165
250	250	256	3	320	–	150	200	115	200	145	215	165
315	315	321	3	320	–	150	200	115	200	145	215	165
400	400	408	4	320	43	150	200	115	200	145	215	165
500	500	508	4	320	93	150	200	115	200	145	215	165

## FDO dimensions with flanges (as an option)

Damper size	Inside dimensions	Bolt circle	Outside dimensions	Material thickness	Bolt holes	Bolt holes Qty	Housing Length	Blade	FDO-EL		
									Eledrive CSQP / Schischek	Belim BF	
Ø	A	B	C	T	D	E	F	G	H	I	H
100	100,8	120	200	3,6	8,5	4	206	–	150	200	115
125	125	150	225	4	8,5	4	206	–	150	200	115
160	160	185	260	3	8,5	4	206	–	150	200	115
200	200	225	300	3	8,5	4	326	–	150	200	155
250	250	280	350	3	12	4	326	–	150	200	115
315	315	355	415	3	12	8	326	–	150	200	115
400	400	450	500	3	12	8	326	40	150	200	115
500	500	560	600	3	12	12	326	90	150	200	115

## Material and Finishing

PART	MATERIAL	FINISHING
Frame	Carbon steel	Painted or galvanised
Frame	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	–
Blades	Steel	–
Blades	Stainless steel EN 1.4301 (AISI304), EN 1.4404 (AISI316L), EN 1.4432 (AISI316L)	–
Maintenance-free bearings	Stainless steel EN 1.4404 (AISI316L)	–
Shafts	Stainless steel EN 1.4404 (AISI316L)	–

## Product Models and Accessories

Halton FDO is available with following actuators:

- FDO-EL: Electrical spring return motor; standard actuators being 24 V or 230 V or 120 V. The motor contains built-in open-closed limit switches. Separate junction box included in the

EL-model. A wide range of Ex actuators available, including a one second closing time function as an option.

- FDO-PNR: Pneumatic rotating actuator
- FDO-SP: Manual spring-actuated damper with fusible link

DOT: manual override function available for PNR and EL models.

HSO: Halton Smart Override function for HVAC damper black-start available for PNR and EL models. With automatic reset function when power and/or pneumatic air supply is reinstated.

A wide range of accessories available.

## Operation principles

In the event of a temperature rise in ductwork:

- FDO-EL: fusible link releases and cuts off operating voltage to the spring return motor, allowing the spring to close the damper blades. The fire damper opens automatically when the fuse has been changed and the operating voltage to the motor is re-established .
- FDO-PNR: fusible link releases and cuts off operating pressure to the spring return actuator, allowing springs to close the damper blades. The fire damper opens automatically when the fuse has been changed and the pneumatic air supply is re-established.
- FDO-SP: fusible link releases allowing the spring to close the damper blades. When the fuse has been changed, the fire damper must be reset into open position manually.

## Weights

### Weights of standard Halton Marine FDO dampers (kg) without an actuator

#### FDO weight without flanges

SIZE ØD (mm)	KG
100	4
125	4,5
160	4,6
200	7,5
250	9
315	12
400	17
500	22,5

## FDO weight with flanges

SIZE ØD (mm)	KG
100	5
125	5,7
160	6,1
200	9,5
250	11
315	14,5
400	20,1
500	26,3

Weights stated above do not include flanges or any actuator.

Examples of actuator weights: FDO-EL CSQP +3,5 kg, BF230 +3,2 kg, BLF230 +1,7 kg, ExMax or Redmax or InMax +3,5 kg, FDO-PNR AT100 (AISI) +6,2 kg, AT150 (AISI) 3 kg, FDO-SP +1 kg.

## Installation

Copies of Operation and Maintenance manuals are available from Halton Marine Sales offices and distributors.

## Product Code

### **(D)=Diameter**

100-500

### **(FA)=Fire Approval**

(C1) ABS American Bureau of Shipping

(C2) MED Marine Equipment Directive

(C3) LRS Lloyds Register

(C4) DNV Det Norske Veritas – GL

### **(EX)=Atex Class**

(NA) No ATEX class (safe area)

(X1) EX II 2 G (Zone 1)

### **(SF)=Flange Option**

(H0) Eurovent flange in circular connections

(H1) Eurovent flange + loose flange in circular connections

(HA) Eurovent flanges

(N0) ISO15138 flange drilling in circular connection

- (N1) ISO15138 flange drilling + Loose flange in circular connection
- (NA) Circular connections without flanges
- (NR) ISO15138 flange drilling

**(FS)=Frame dimensioning**

- (HS) Halton Standard dimensioning
- (SO) SOLAS dimensioning

**(MA)=Material**

- (CS) Carbon steel
- (SS) Stainless steel EN1.4301
- (AS) Stainless steel EN1.4404
- (LS) Stainless steel EN1.4432

**(FM)=Frame Material**

- (A3) Stainless steel (3.0) EN1.4404
- (A4) Stainless steel (4.0) EN1.4404
- (C3) Carbon steel (3.0)
- (C4) Carbon steel (4.0)
- (L3) Stainless steel (3.0) EN1.4432
- (L4) Stainless steel (4.0) EN1.4432
- (S3) Stainless steel (3.0) EN1.4301
- (S4) Stainless steel (4.0) EN1.4301

**(FI)=Finishing**

- (NA) Not Assigned (acid treatment)
- (PN) Painting
- (PX) Special Painting C5-M ISO12944
- (HG) Hot galvanized

**(RE)=Actuator**

- (S1) Spring
- (P0) Pneumatic – Air Torque, AT101, Aluminium
- (P3) Pneumatic – Air Torque, AT104, AISI316
- (E7) Electric BF120 -2 -HL
- (Z3) Ex proofed ExMax 5.10 SF
- (Z2) Ex proofed ExMax 15 SF
- (R2) Ex proofed RedMax 15-SF
- (I1) InMax 15-SF
- (E3) Electric BF230-2-HL
- (E1) Electric BF24-2-HL
- (L1) Electric BLF24-HL
- (L5) Electric BLF230-HL
- (C1) Electric CSQP-05A1E 24V
- (C2) Electric CSQP-05A2E 120/230V
- (C3) Electric CSQP-10A1E 24V
- (C4) Electric CSQP-10A2E 120/230V
- (C5) Electric CSQP-15A1E 24V
- (C6) Electric CSQP-15A2E 120/230V
- (Q3) Pneumatic Rot AT051, AL
- (Q4) Pneumatic Rot AT054, AISI316

**(FU)=Fuse**

144 °C  
100 °C  
95 °C  
74 °C  
72 °C  
70 °C  
65 °C  
50 °C

**(AC)=Accessories**

(E1) Junction box, plastic IP65 :  
(E2) Ex proofed junction box, IP65, T6 :  
(L1) Limit switch, 1 pcs IP66 :  
(L2) Limit switch, 2 pcs IP66 :  
(L3) Ex proofed limit switch, 1 pcs IP65 :  
(L4) Ex proofed limit switch, 2 pcs IP65 :  
(M1) Solenoid valve 24 VDC :  
(M2) Solenoid valve 230 VAC :  
(M3) Ex Solenoid valve 24 VDC (Brass) (Norgren)  
(M4) Ex solenoid valve 230 VAC (SS) (Norgren)  
(P1) Pneumatic valve, manual  
(S3) SN2 auxiliary switch  
(ST) Stainless steel tubing

**Code example**

FDO-100,FA=C2,SF=HA,FS=SO,MA=CS,FM=C3,FI=PN,RE=C2,FU=50,ZT=N,AC=L1