mcr FID PRO

low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

PRODUCT CONFIGURATOR AT WWW.MERCOR.COM.PL

1488-CPR-0467/W

1396-CPR-0098

ATEST HIGIENICZNY

CERTYFIKACJA PRODUKTU

- **EIS120, E180S**
- **Certificate of constancy of performance 1488-CPR-0467/W and 1396-CPR-0098.**
- **Dampers certified for compliance with EN 15650.**
- **Dampers qualified under EN 13501-3 and tested under EN 1366-2.**
- **Cut-off dampers with the fire resistance independent of airflow direction and installation side.**
- **Lower acoustic noise and hydraulic resistance in the system with reduced partition thickness.**

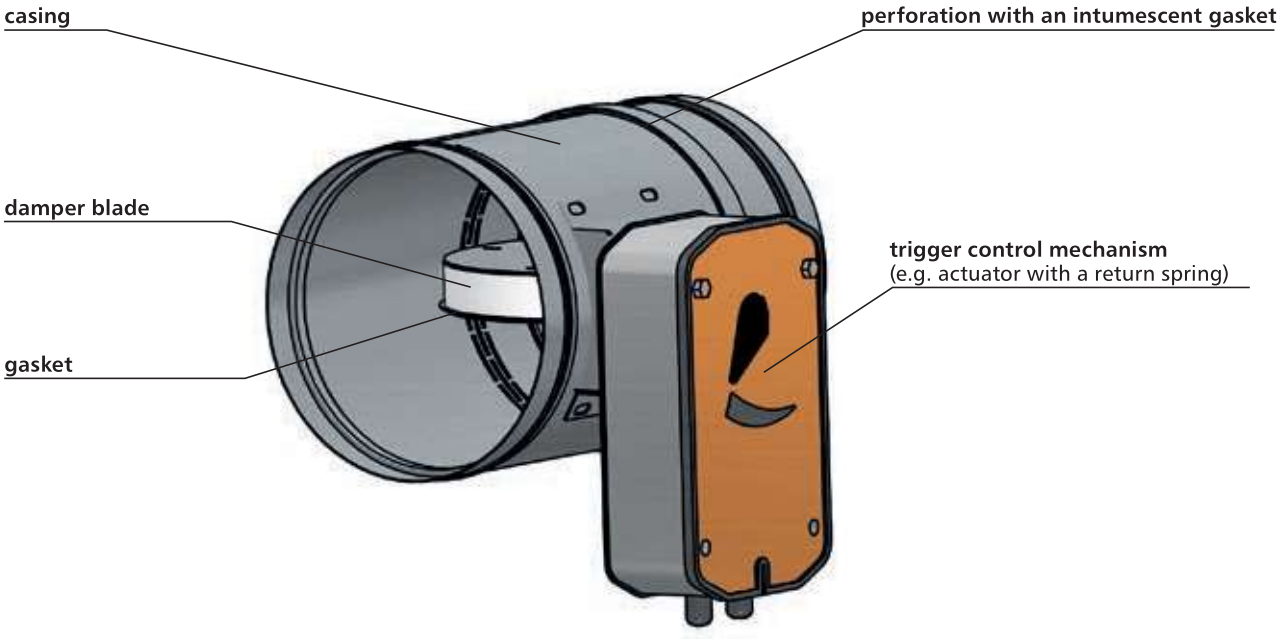
4.1. application

The mcr FID PRO low-resistance cut-off dampers are designed for use in residential ventilation systems, where those systems pass through vertical and horizontal construction partitions. They are installed e.g. in systems with increased acoustic requirements.

During a fire, the dampers preserve the fire resistance of the construction partition where ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and burning fumes to the remaining part of the building not on fire. During normal system operation, the damper blade is open. In case of fire, the damper blade closes.

The dampers cannot be operated in systems exposed to dust, except for when they are included in a special, individually developed programme of service and technical inspections.

4.2. design



The mcr FID PRO cut-off fire dampers consist of a casing with a circular cross section, a moving damper blade and a trigger control mechanism, which is activated remotely or automatically when the thermal or thermoelectric trigger is tripped. Standard damper casing is made of galvanised steel sheet. For chemically aggressive environments, special manufacture casing is used, in which steel elements are made of 1.4404 acid-proof steel sheet, while other elements are impregnated.

In the middle part, in which the damper blade is placed, the casing is perforated - perforation width is 20 mm. On the damper circumference, around the closed damper blade, there is an intumescent gasket. The damper blade is made of a fire-proof panel with the total thickness of 20 mm.

The damper blade is coated with steel sheet on both sides for mechanical reinforcement and reduced friction resistance. The damper circumference has a ventilation gasket installed, which ensures the tightness of dampers at the ambient temperature. Both ends of the casing are finished nipple (standard) or muff connection.

4.3. versions

4.3.1. **mcr FID PRO** – the cut-off fire damper for ventilation ducts with an actuator with a return spring – damper closing and opening with an actuator

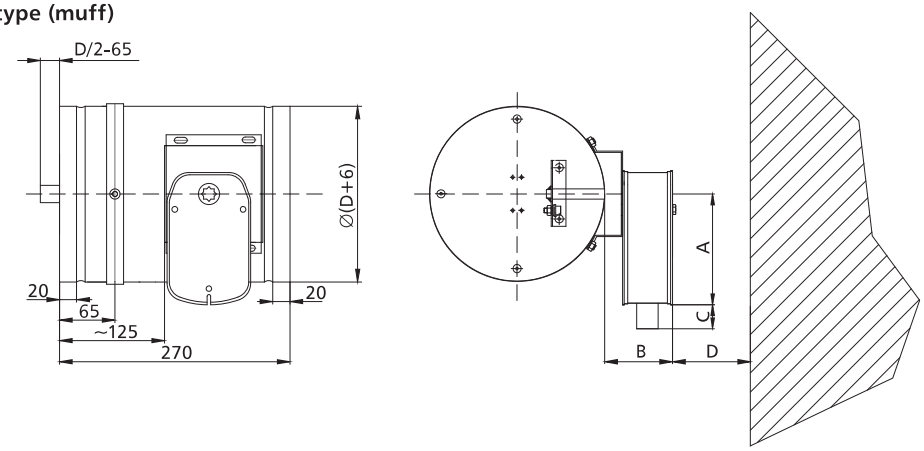
During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or remotely when the power supply is cut off.

The mcr FID PRO dampers are equipped with a Belimo trigger control mechanisms **BFL, EXBF** or **BF-TL** axial actuator with a return valve, powered with 24 V AC/DC or 230 V AC, with thermoelectric trigger 72°C (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). The actuators are equipped with limit switches used to monitor the blade position. Furthermore, the mechanical position indicator is placed on the actuator.

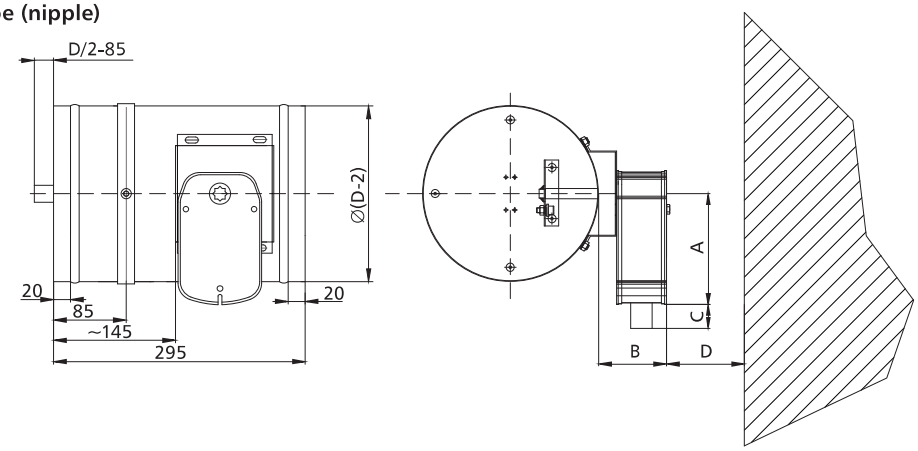
The thermoelectric trigger is equipped with a test switch and a power supply indicator (LED).

Dampers with Belimo actuators: analogue BFL, digital BF-TL, EXBF explosion proof actuators close as a result of thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when the power supply voltage is applied to the actuator terminals. Furthermore, dampers with those actuators may be opened manually using a key.

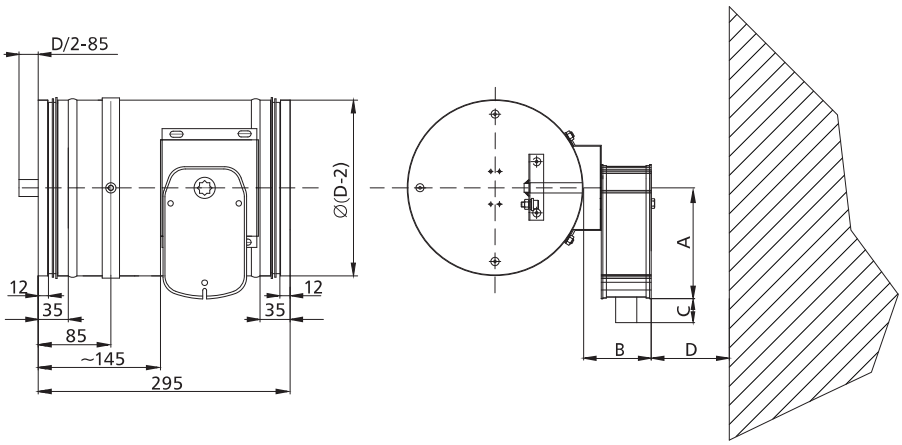
female connection type (muff)



male connection type (nipple)

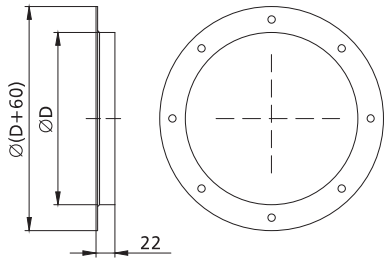


version with circumferential seal type F



mechanism	A	B	C	D
BFL	138	74	30	75
BF24TL-ST	198	85	10	75
EXBF	225	190	55	100

flange connection



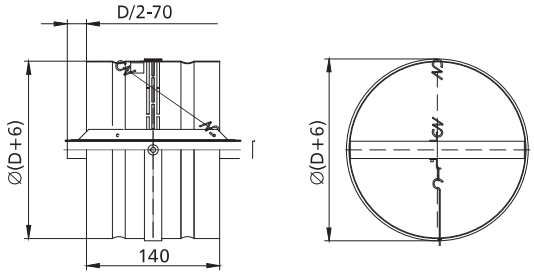
Spacing and quantities of openings according to EN 12220 (dimensions of flanges with circular intersection for comfort ventilation purposes).

4.3.2. mcr FID PRO – the cut-off fire damper for ventilation ducts with a spring drive and thermal trigger

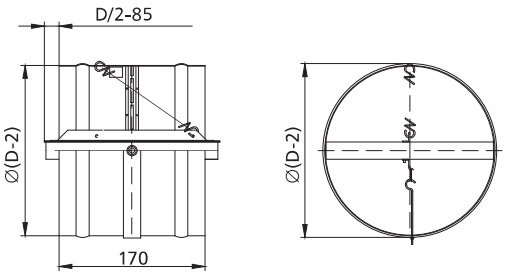
During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically.

The mcr FID PRO dampers are equipped with a **RST** trigger control mechanism with a drive spring (without an integrated thermal trigger). In this case, a thermal trigger 74°C (optionally 95°C) is installed outside the damper mechanism, on the damper blade itself. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. It is possible to equip the damper with a WK1 or WK2 limit switch used to signal the blade position state.

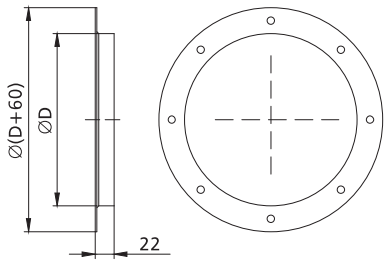
female connection type (muff)



male connection type (nipple)



flange connection



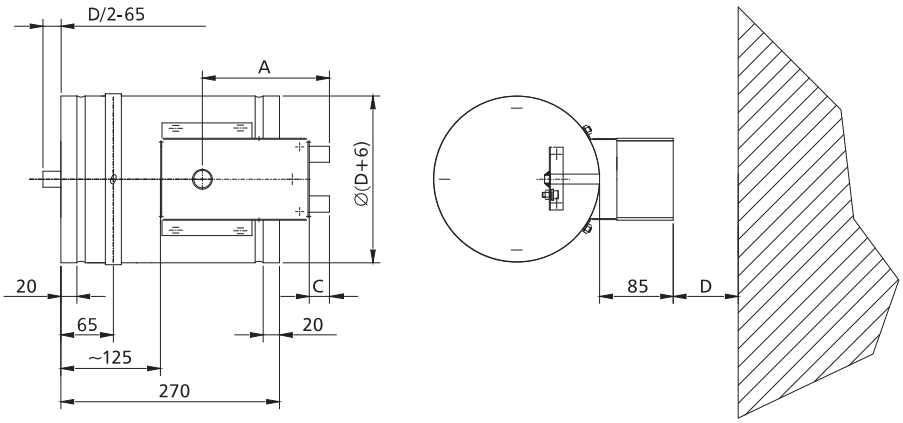
Spacing and quantities of openings according to EN 12220 (dimensions of flanges with circular intersection for comfort ventilation purposes).

4.3.3. mcr FID PRO – the cut-off fire damper for ventilation ducts with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches

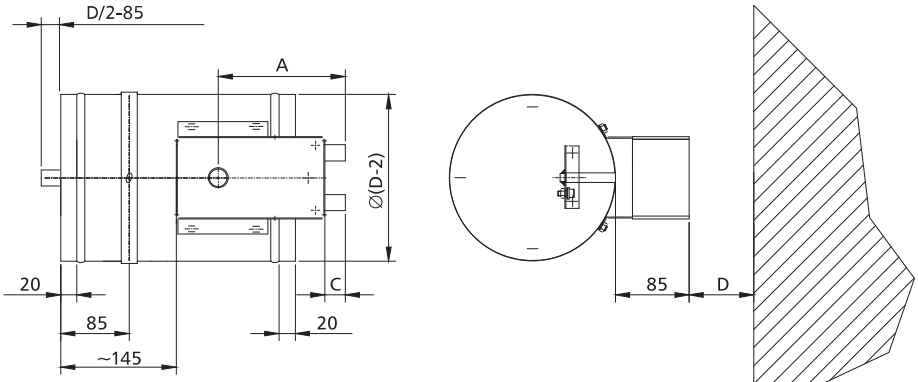
During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or, in case of a damper with an electromagnetic trigger, additionally using the fire automation.

The mcr FID PRO dampers are equipped with a **RST-KW1** trigger control mechanism with a drive spring and a cam-lever system. A thermal trigger 74°C (optionally at 95°C) is integrated with the damper mechanism. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. On the RST-KW1 mechanism, there is a mechanical indicator of blade position. It is possible to equip a trigger control mechanism with an electromagnetic trigger activated by the application („pulse") or removal („break") of the power supply voltage and with limit switches used to signal the blade position state. The mechanism has function to test and blade button-release. Blade re-opening is activated manually using a key. It is not required to dismantle the system to replace the thermal trigger. The RST-KW1 mechanism may be replaced with an electric actuator.

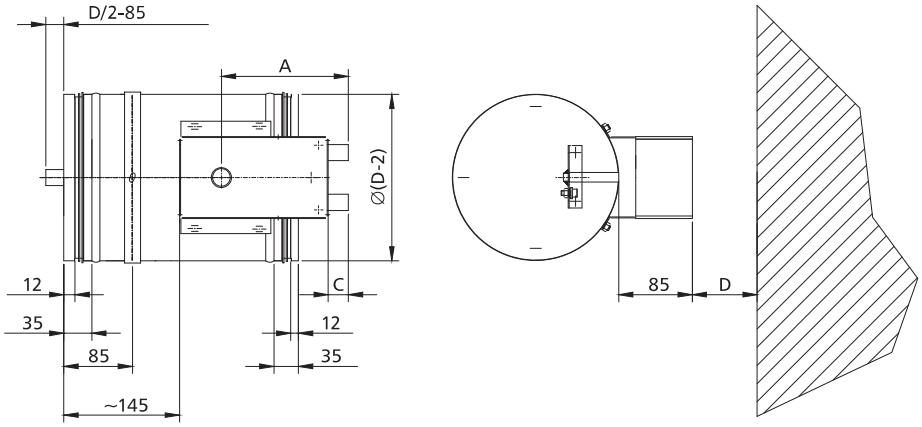
female connection type (muff)



male connection type (nipple)

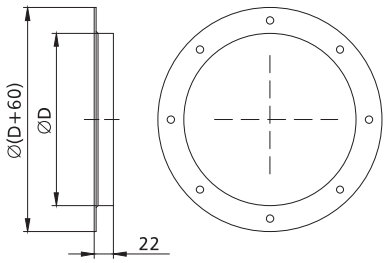


version with circumferential seal type F



mechanizm	A	C	D
RST-KW1	130	30	75

flange connection



Spacing and quantities of openings according to EN 12220 (dimensions of flanges with circular intersection for comfort ventilation purposes).

4.4. dimensions

Circular dampers:

- nominal diameter D from 100 mm to 315 mm

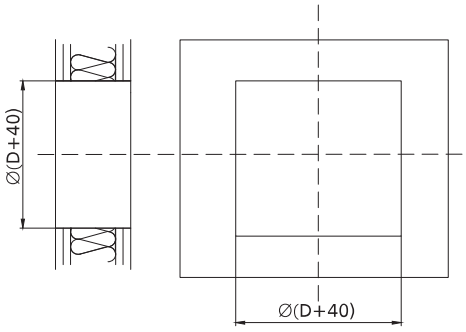
Apart from the standard dimensions there is a possibility to produce dampers with intermediate dimensions (in 1 mm increments, in the given range).

4.5. installation

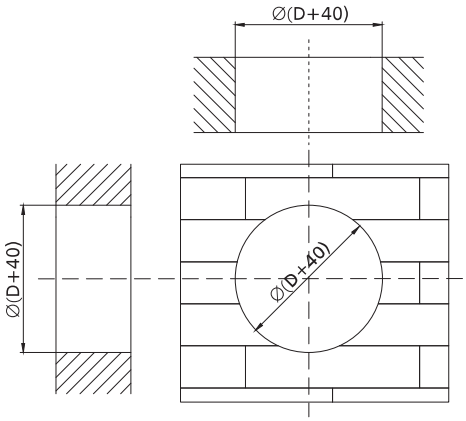
The mcr FID PRO circular dampers are EI120(ve ho i↔o)S-rated when installed in concrete partitions made of full bricks or cellular concrete blocks with the thickness of at least 125 mm, lightweight walls of cardboard-plaster panels on a steel framework with the thickness of at least 125 mm and the resistance class of not less than EI120 and concrete ceilings with the thickness of at least 150 mm. Additionally dampers mcr FID PRO with diameter 201-315 mm installed in concrete ceilings are E180(ho i↔o)S-rated.

4.5.1. preparation of installation openings

in light plaster-cardboard walls

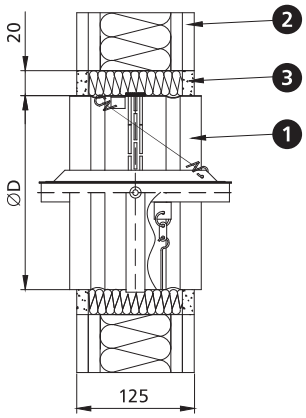


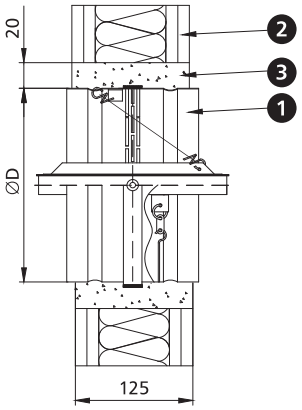
in rigid walls and ceilings



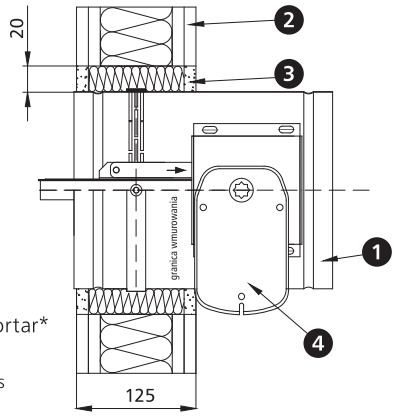
4.5.2. sample installation in lightweight walls of plaster-cardboard panels

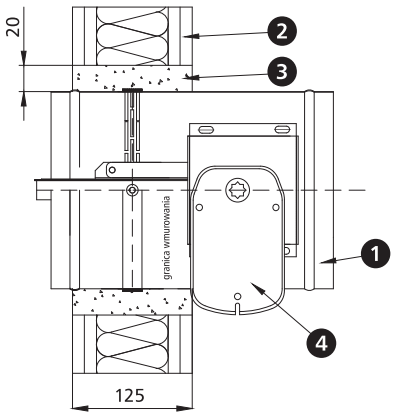
mcr FID PRO damper with a RST mechanism





mcr FID PRO damper with a BFL or RST-KW1 mechanism



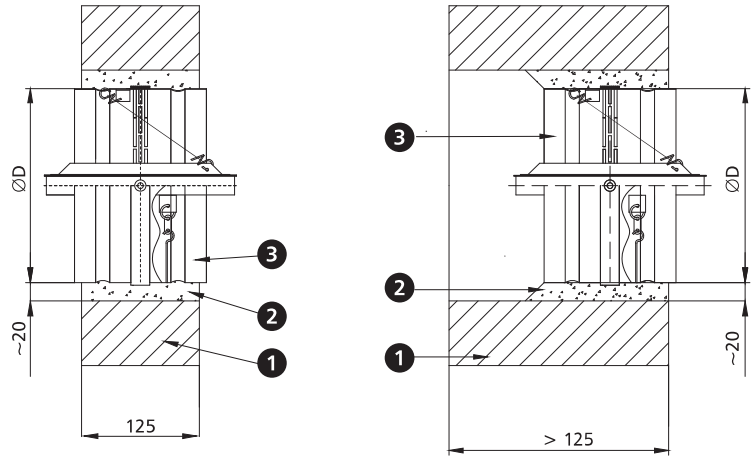


1. fire damper mcr FID PRO
2. lightweight wall
3. sealing - mineral wool with the density of at least 80 kg/m^3, A1 class and/or plaster mortar*
4. trigger control mechanism

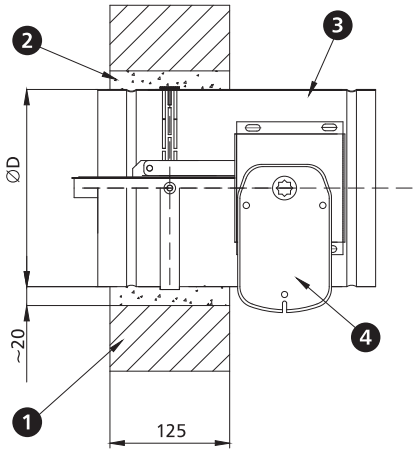
*it is possible to use a different sealing which ensures the required fire resistance

4.5.3. sample installation in concrete and masonry walls

mcr FID PRO damper with a RST mechanism



mcr FID PRO damper with a BFL or RST-KW1 mechanism

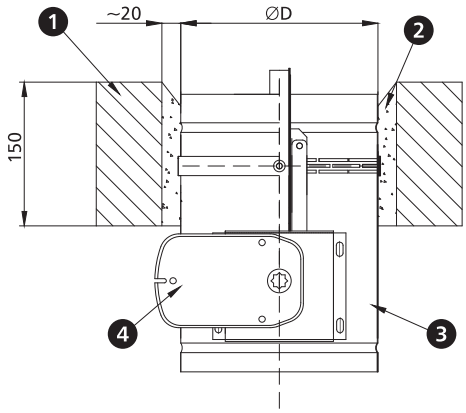


1. rigid wall - concrete, cellular concrete or bricks
2. sealing - concrete, cement or cement-lime masonry mortar*
3. fire damper mcr FID PRO
4. trigger control mechanism

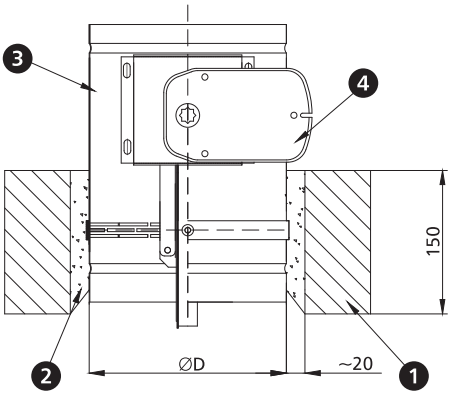
*it is possible to use a different sealing which ensures the required fire resistance

4.5.4. sample installation in ceilings

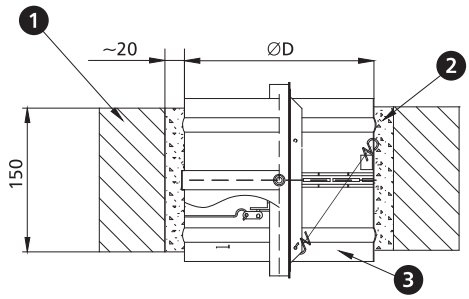
mcr FID PRO damper with a BFL or RST-KW1 mechanism



mcr FID PRO damper with a BFL or RST-KW1 mechanism



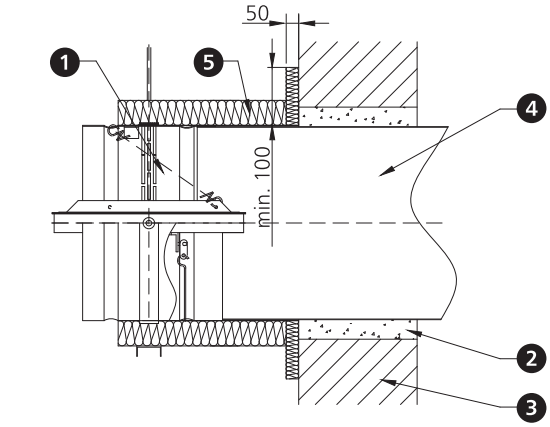
mcr FID PRO damper with a RST mechanism

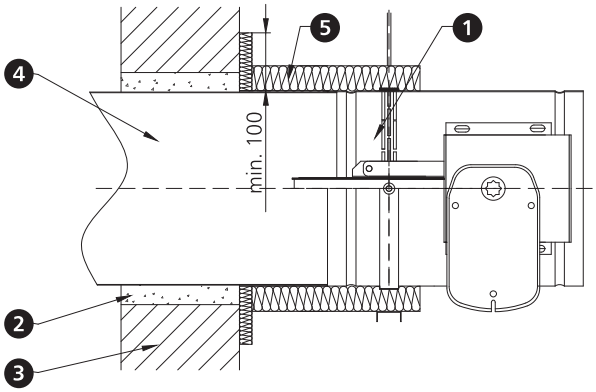


1. ceiling
2. sealing - concrete, cement or cement-lime masonry mortar*
3. fire damper mcr FID PRO
4. trigger control mechanism

*it is possible to use a different sealing which ensures the required fire resistance

4.5.5. sample installation outside the fire partition

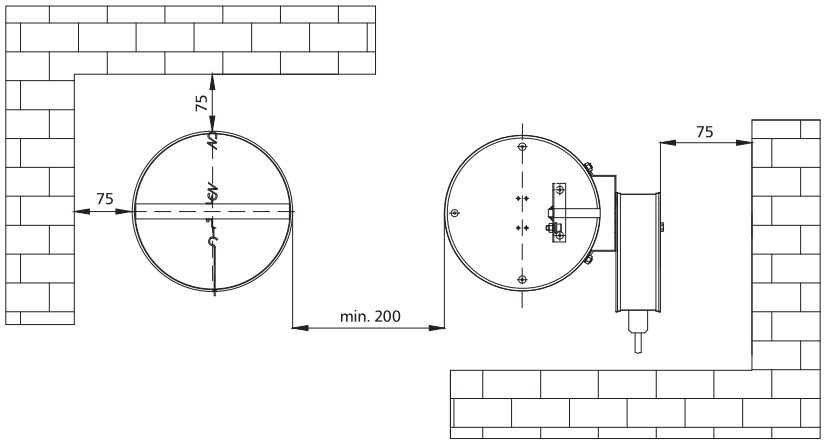




1. fire damper mcr FID PRO
2. e.g. cement mortar*
3. wall
4. ventilation duct
5. mineral wool with the density of at least 80 kg/m^3 and thickness 30 mm, A1 class

*it is possible to use a different sealing which ensures the required fire resistance

Distance between systems and partitions



4.6. technical parameters of mcr FID PRO circular dampers

D – nominal diameter [mm]
v – velocity [m/s]
Sk – duct cross-section [m^2]
Se – damper active cross-section [m^2]
Q – flow [m^3/h]
weff – velocity measured on the damper active surface [m/s]
dp – pressure drop [Pa]
L_{WA} – damper noise level [dB]

mcr FID PRO 100

d [mm]	Sk [m^2]	Se [m^2]	v [m/s]	Q [m^3/h]	weff [m/s]	dp [Pa]	L_{WA} [dB]
100	0.0079	0.0057	2.0	41	2.8	4.5	21
			4.0	81	5.5	14	29
			6.0	122	8.3	26	37
			8.0	163	11.1	42	43

mcr FID PRO 125

d [mm]	Sk [m^2]	Se [m^2]	v [m/s]	Q [m^3/h]	weff [m/s]	dp [Pa]	L_{WA} [dB]
125	0.0123	0.0095	2.0	69	2.6	3	19
			4.0	137	5.2	10	27
			6.0	206	7.8	20	36
			8.0	274	10.4	33	42

mcr FID PRO 160

d [mm]	Sk [m^2]	Se [m^2]	v [m/s]	Q [m^3/h]	weff [m/s]	dp [Pa]	L_{WA} [dB]
160	0.0201	0.0166	2.0	119	2.4	2	17
			4.0	239	4.8	6	23
			6.0	358	7.3	15	34
			8.0	477	9.7	24	41

mcr FID PRO 200

d [mm]	Sk [m^2]	Se [m^2]	v [m/s]	Q [m^3/h]	weff [m/s]	dp [Pa]	L_{WA} [dB]
200	0.0314	0.027	2.0	194	2.3	1	16
			4.0	389	4.7	5	21
			6.0	583	7.0	11	33
			8.0	778	9.3	20	40

mcr FID PRO 250

d [mm]	Sk [m^2]	Se [m^2]	v [m/s]	Q [m^3/h]	weff [m/s]	dp [Pa]	L_{WA} [dB]
250	0.0491	0.0391	2.0	282	2.5	2	18
			4.0	564	5.0	4	21
			6.0	846	7.5	7	29
			8.0	1127	10.0	10	33

mcr FID PRO 315

d [mm]	Sk [m^2]	Se [m^2]	v [m/s]	Q [m^3/h]	weff [m/s]	dp [Pa]	L_{WA} [dB]
315	0.0779	0.0654	2.0	471	2.4	2	18
			4.0	942	4.8	4	23
			6.0	1413	7.1	7	31
			8.0	1884	9.5	13	39

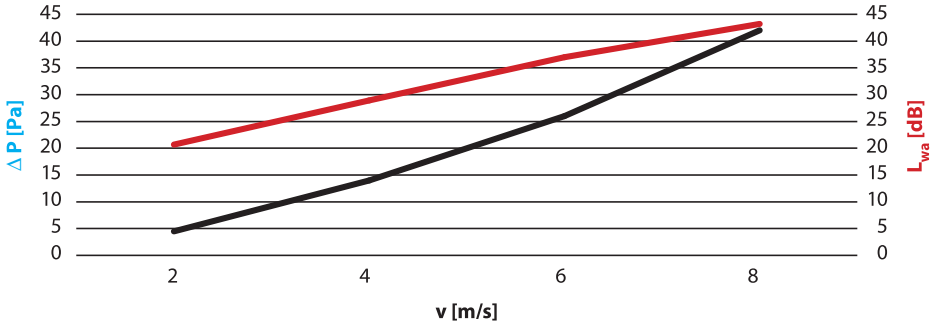
The mcr FID PRO fire damper selection program is available at **www.mercor.com.pl**, in the Architect and Designer Zone.

4.6.1 flow characteristics in circular mcr FID PRO dampers

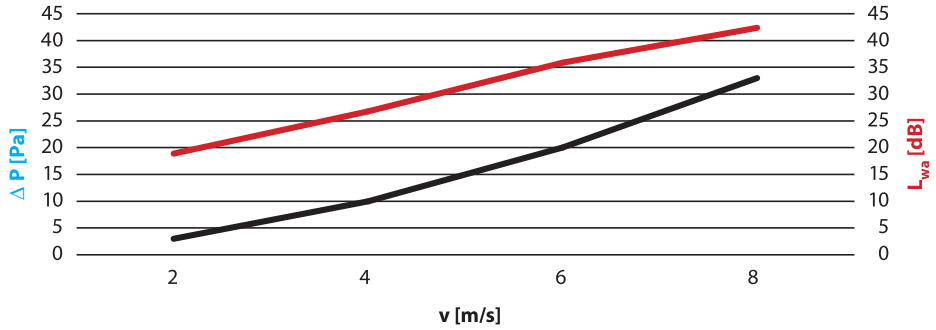
pressure drop on a damper

damper noise level

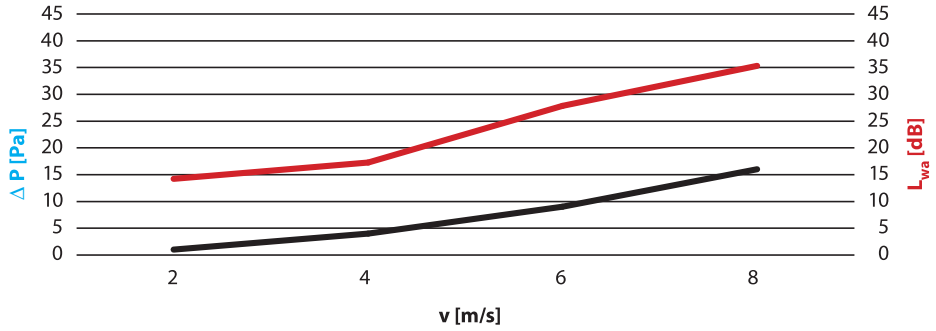
mcr FID PRO 100



mcr FID PRO 125



mcr FID PRO 160

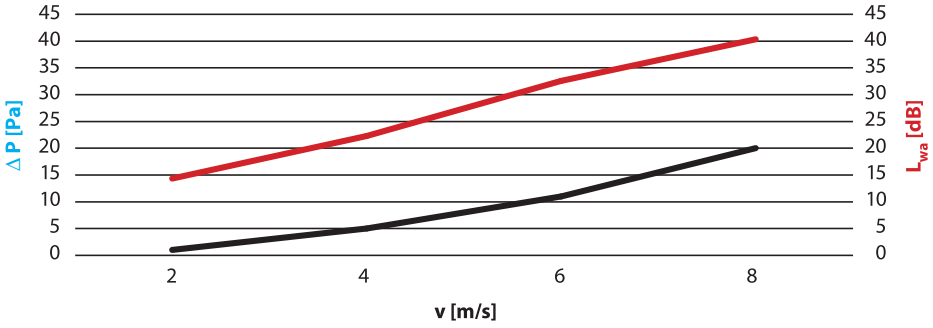


4.6.1 flow characteristics in circular mcr FID PRO dampers

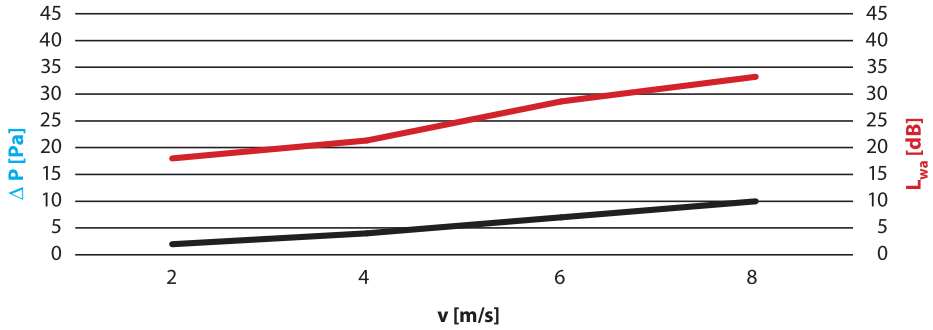
pressure drop on a damper

damper noise level

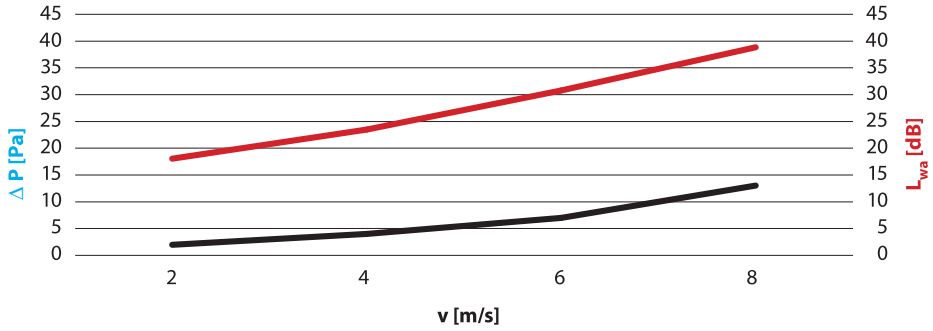
mcr FID PRO 200



mcr FID PRO 250



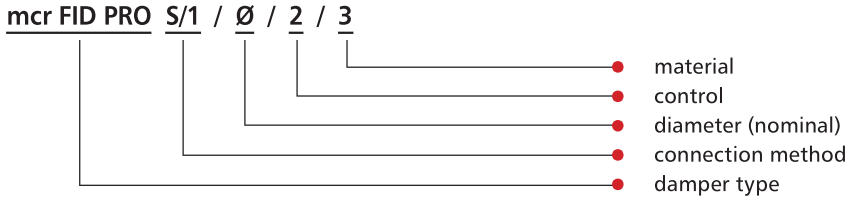
mcr FID PRO 315



4.7. estimated weights of mcr FID PRO dampers for circular ventilation ducts [kg]

diameter D [mm]	RST	actuator/RST-KW1
100	0.7	3
125	0.9	3.2
160	1.2	3.6
200	1.7	4.2
250	2.1	4.6
315	2.6	5.1

4.8. marking



1 – connection method:

N or **[no symbol]** – male connection (nipple)
M – female connection (muff)
K – flange

2 – control:

– RST trigger control mechanism
RST – thermal trigger
RST/WK1 – thermal trigger + limit switch (closed blade signal)
RST/WK2 – thermal trigger + limit switch (open/closed blade signal)

– RST-KW1 trigger control mechanism
RST-KW1/S – thermal trigger
RST-KW1/S/WK2 – thermal trigger + limit switch (open/closed blade signal)
RST-KW1/24I – thermal trigger + „pulse" electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
RST-KW1/24P – thermal trigger + „break" electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
RST-KW1/230I – thermal trigger + „pulse" electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
RST-KW1/230P – thermal trigger + „break" electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

– Belimo trigger control mechanism
BF24TL-T-ST (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
EXBF24-T – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
EXBF230-T – explosion proof actuator with a return spring in the Ex version, U = 230 V AC
BFL24-T – actuator with a return spring, U = 24 V AC/DC
BFL230-T – actuator with a return spring, U = 230 V AC
BFL24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system

3 – material:

[no symbol] – galvanised steel, Zn 275 g/m^2 coating
KN – 1.4404 acid-proof stainless steel

example marking:

mcr FID PRO Ø125 BFL24-T

EIS120 low-resistance cut-off damper with a 24 V compact Belimo actuator with a thermoelectric trigger and limit switches.

mcr FID PRO Ø125 RST/WK1

EIS120 low-resistance cut-off fire damper with a trigger rated at 74°C and a partition closing limit switch.

Chapter 12 - power supply and control (p. 141) contains:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.