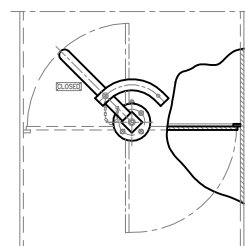
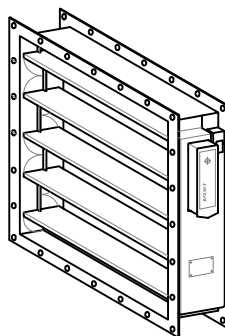


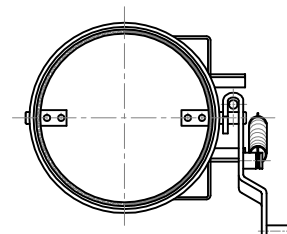
Circular cut-off dampers CFD



Rectangular cut-off dampers RFD

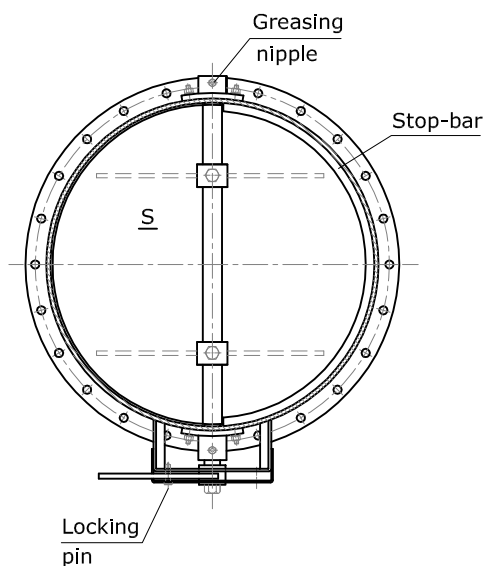
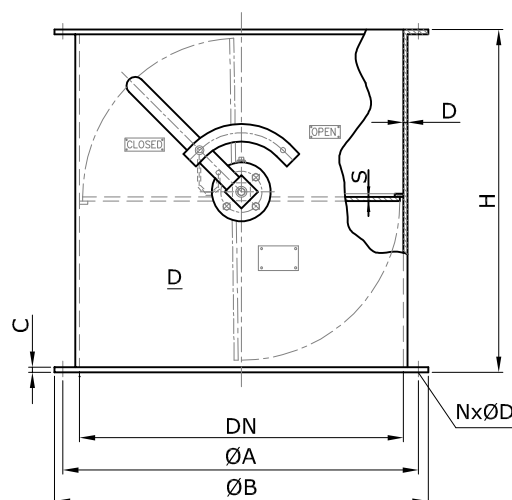


Automatic fire dampers FDA



Smoke dampers SD

DN	A	B	NxØD	C	D	H	S	Weight, kg
160	220	250	16xØ12	10	8,8	160	4	8,4
200	260	290	16xØ12	10	8,8	200	4	13,0
250	310	340	16xØ12	10	8,8	250	5	20,4
315	370	405	24xØ12	10	9	315	5	32,4
400	460	490	24xØ12	10	10	400	5	52,2
500	560	590	32xØ12	12	10	500	6	81,6
560	640	690	32xØ14	12	10	560	6	91,4
630	695	730	32xØ14	12	10	630	7	129
710	775	810	48xØ14	12	10	710	7	164
800	865	900	48xØ14	12	10	800	7	209
900	965	1000	64xØ14	12	10	900	8	260
1000	1065	1100	64xØ14	12	10	1000	8	326
1120	1205	1100	64xØ14	12	10	1120	8	409
1250	1335	1380	64xØ14	12	10	1250	8	510
1400	1485	1530	64xØ14	12	10	1400	8	643
1600	1685	1730	64xØ14	12	10	1600	8	773



DESTINATION

The CFD circular cut-off dampers are destined for installation in ventilation systems of seagoing ships and offshore objects. They may be used as fire closure of main ventilation inlets and outlets as per SOLAS regulations.

CONSTRUCTION

CFD dampers consist of steel flanged casing and rotary steel flap of thickness corresponding to requirements of regulations.

Shaft bearings provided with greasing nipples, maintenance-free bearings on request.

Lever for manual control with locking pin with chain.

Damper may be supplied loose, without casing, for Customer-made coaming (to be specified in Order).

SURFACE TREATMENT

Steel components of dampers painted with set of marine paints. Hot-dip galvanised on request.

MARKING

of CFD cut-off damper of nominal diameter DN=500:

CIRCULAR CUT-OFF DAMPER CFD-500

DIMENSIONS AND WEIGHTS, kg

		A											
		100	160	200	250	315	400	500	630	710	800	900	1000
B	100	2,7											
	160	2,9	3,2										
	200	3,2	3,7	3,9									
	250	3,4	4,5	4,7	5,7								
	315	3,7	5,3	5,0	6,6	7,4							
	400		6,2	6,9	7,4	8,2	9,3						
	500			7,8	8,6	9,5	10,9	15,4					
	630				13,6	15,7	17,1	19,3	22,2				
	710					17,2	18,3	22,7	26,4	30,7			
	800					19,8	22,8	26,3	30,7	33,6	41,3		
	1000						26,1	34,6	40,6	44,1	48,1	61,2	
	1250							41,7	51,3	55,7	60,8	66,5	
	1400								63,7	62,8	75,2	72,1	89,8
	1600									77,4	85,1	92,3	99,6
	2000											111	120

EVALUATION OF THICKNESS 'S'

Cross-section of duct, m ²	S
Up to 0,03	4
over 0,03 u.t. 0,13	5
over 0,13 u.t. 0,28	6
over 0,28 u.t. 0,50	7
over 0,50	8

DESTINATION

The RFD rectangular cut-off dampers are destined for installation in ventilation systems of seagoing ships and offshore objects. They may be used as fire closure of main ventilation inlets and outlets as per SOLAS regulations.

CONSTRUCTION

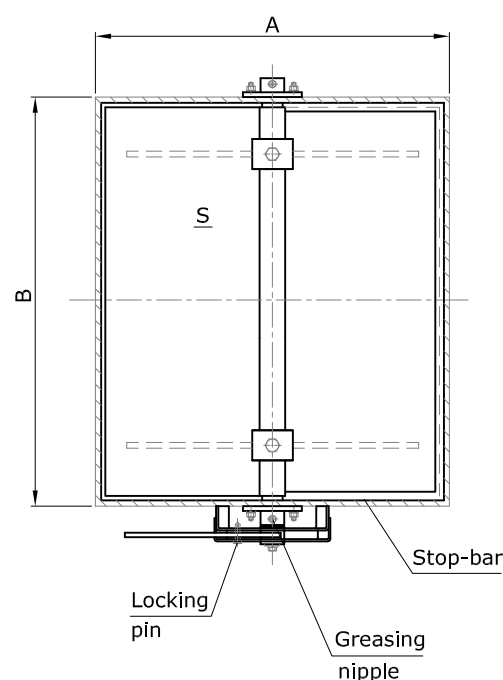
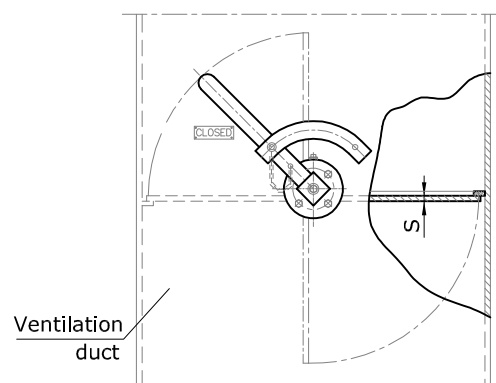
RFD dampers consist of rotary steel flap of thickness corresponding to requirements of regulations (see table) and associated shaft with bearings and control lever.

Shaft bearings provided with greasing nipples, maintenance-free bearings on request.

Lever for manual control with locking pin with chain.

Damper may be supplied with flanged casing.

Dimensions to be than defined by the Customer.



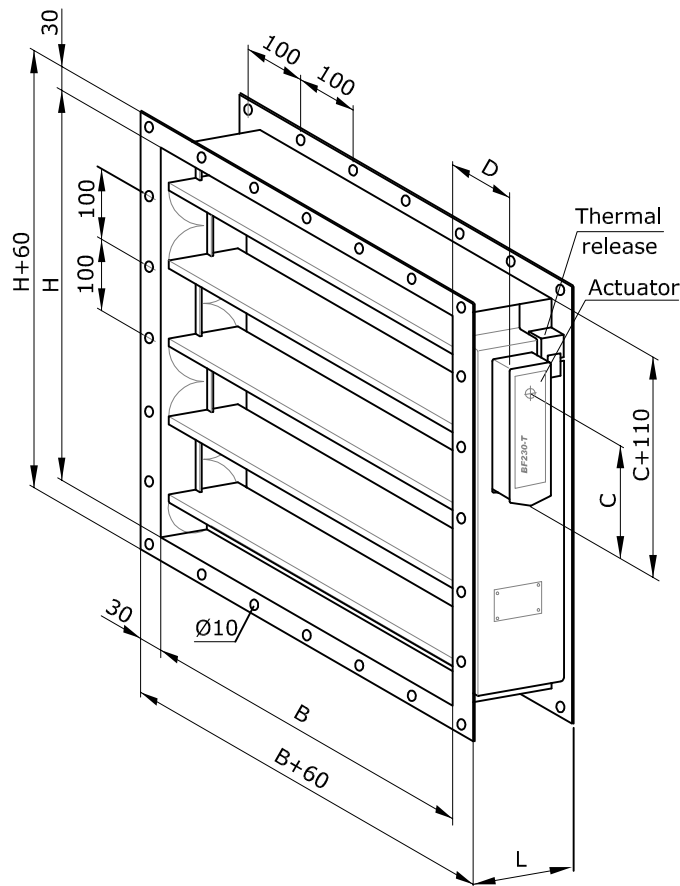
SURFACE TREATMENT

Steel components of dampers painted with set of marine paints. Hot-dip galvanised on request.

MARKING

of RFD cut-off damper of dimensions (duct)
AxB=315x500

RECTANGULAR CUT-OFF DAMPER
RFD-315x500



DIMENSIONS

BxH	for B or H	S
100x100 to 1400x1500	100 - 315 400, 500 630-1500	3 4 5

L	C	D	
220	200	100	Standard execution
300	230	210	Dampers with EExd electric actuator

DESTINATION

The fail-safe marine automatic fire dampers FDA-type are designed for installation in ventilation and air-conditioning ducts at A0-A60 fire class divisions (decks and bulkheads). They prevent the spread of fire and smoke within the ventilation ductwork.

CONSTRUCTION

FDA fire dampers consist of flanged steel casing with opposed blades filled with fire-resistant mineral wool sealed with thermal expanding gasket. Fail-safe is made by thermal release device which operates if temperature inside the duct increases above 72 deg.C (optionally 90 deg.C, e.g. for galley applications).

Then, or if power supply is interrupted, spring-return actuator closes the blades.

The damper is open automatically when the thermal element has been replaced or operating voltage is reconnected.

The blades actual position is clearly marked on its casing.

Electrically operated fire dampers are provided with device for manual override for case of actuator failure.

TYPES AND EXECUTIONS

FDA automatic fire dampers are manufactured with electric or pneumatic actuators, both of single-action return spring.

Electric actuator with voltage 24 or 230 V, frequency 50/60 Hz, enclosure IP54. Power consumption 8 W at spring tightening and 3 W if blades are kept in open position. Damper release time 20 seconds, reset time 150 seconds.

Pneumatic actuator for 5-8 bars gas working pressure, release/reset time less than 5 seconds. Electric supply for electro-pneumatic control valve and limit switches - 24 or 230 V, 50/60 Hz.

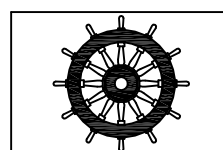
Both electrically and pneumatically driven fire dampers are produced in standard and explosion-proof executions, with non-sparking movable co-operating elements and EExdIICT6 class electrical equipment.

DAMPER CONTROL DEVICE

FDA fire dampers can be supplied with or without remote control/indicating device.

For dampers with electric actuator it comprises one or two controllers for closing/opening and red/green lamps for indication of damper actual position. Controllers are to be installed on one or both sides of protected partition according to the Regulations.

Dampers with pneumatic actuator, in addition to above, can be fitted with delivered loose electro-pneumatic valve for actuator control.



0801-03

APPLICATION

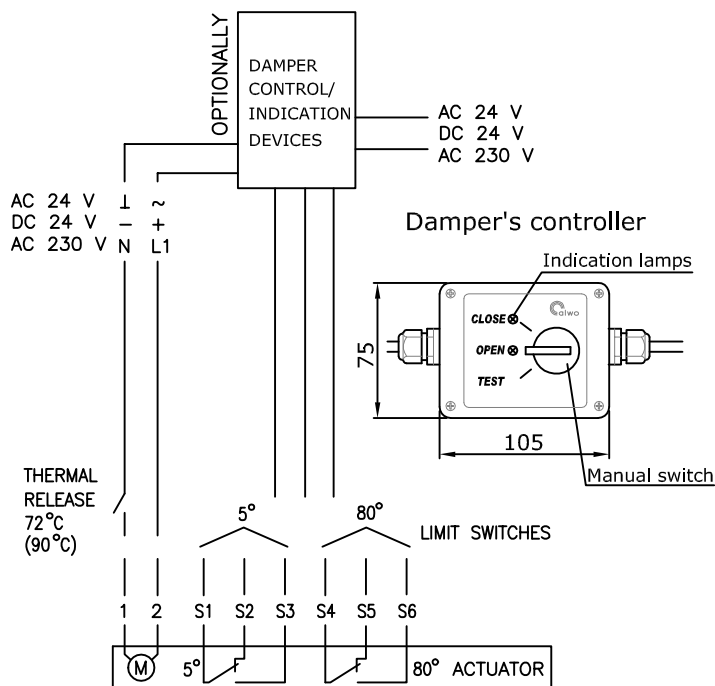
FDA fire dampers have been fire tested in accordance with approval procedure of IMO Resolution A.754(18) 1994.

Dampers FDA-type can be installed on A-0, A-15, A-30 and A-60 fire class decks and bulkheads where required by SOLAS 2011 Part II-2 Reg.9.4.1.1.9, 9.7.2, 9.7.3, 9.7.4.6, 9.7.5.1.1 and 9.7.6.

provided that:

- dampers are fitted to deck or bulkhead by means of penetration as required by Rules
- penetration and damper's casing are fire insulated as required by Rules
- gasket between damper and penetration flanges, if fitted, must be of non-combustible material as defined by IMO FTPC Part 1. Alternatively, gasket of PROMASEAL PL, thickness 2,5 mm (PROMAT GmbH, Germany), may be used.

DIAGRAM OF CONTROLS FOR ELECTRICALLY OPERATED DAMPERS



CERTIFICATES

Germanischer Lloyd Approval Certificate
No 50 700 - 03 HH

Marine Equipment Directive 96/98/EC
EC Type Examination Certificate
No 50 701 03 Lux

Mark of Conformity  0801-03 (MED)

MARKING

Example of FDA fire damper marking:

FDA-500x300-EL230-ST-CS-72-2C

500x300 - damper width/height, see table

EL230 - electric actuator, voltage 230V

EL24 - electric actuator, voltage 24V

PN230 - pneumatic actuator, voltage 230V

PN24 - pneumatic actuator, voltage 24V

ST - standard execution

EX - explosion-proof execution

CS - damper material - carbon steel

SS - damper material - stainless steel

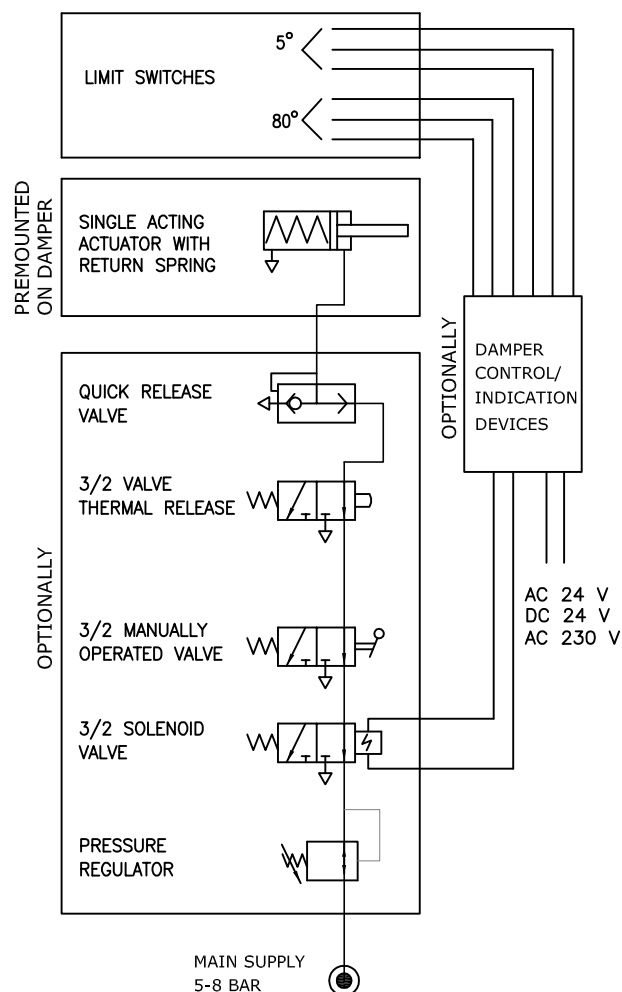
72 - release temperature, 72 deg.C

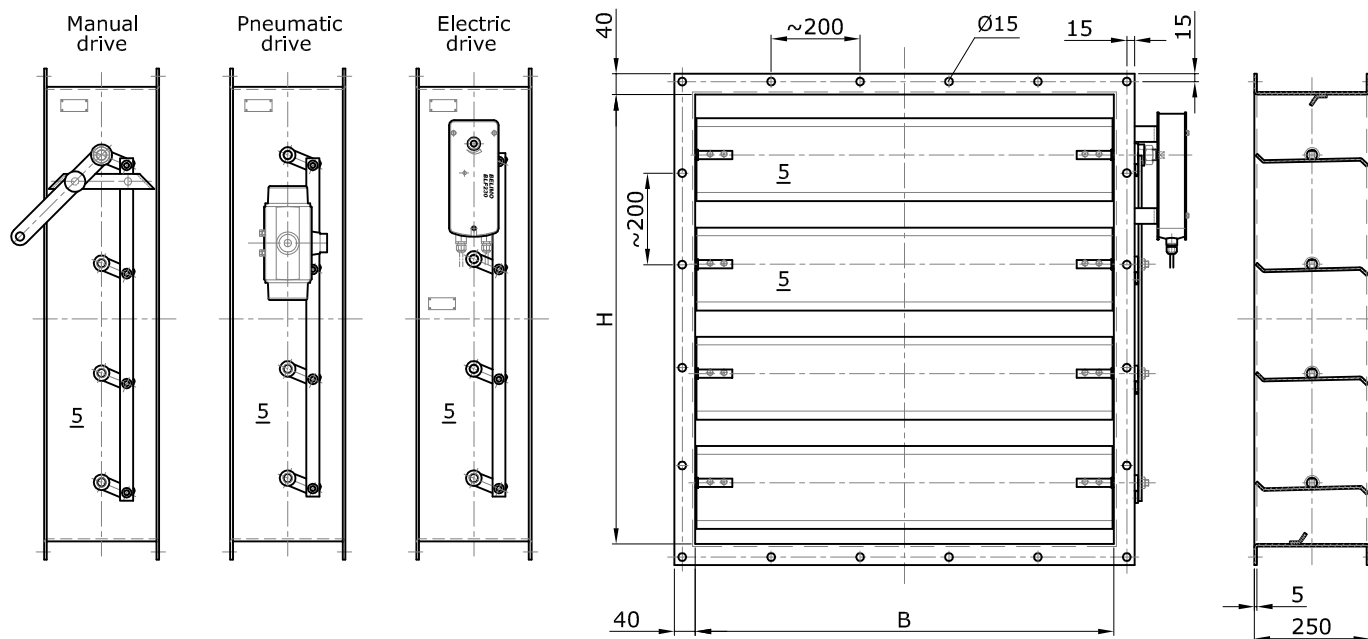
2C - damper with two controllers

1C - damper with one controller

NC - damper without controllers

DIAGRAM OF CONTROLS FOR PNEUMATICALLY OPERATED DAMPERS





1.DESTINATION

Marine ventilation cut-off dampers COD are destined for installation in ventilation systems of seagoing ships and offshore objects.

Dampers may be used as functional isolating dampers or as fire closure of main external ventilation openings as required by SOLAS.

1.CONSTRUCTION

Marine ventilation cut-off dampers COD consist of mild steel frame and rotary blades actuated by electric actuator, pneumatic actuator or manually.

Thickness of blades and housing is 5 mm, other available on request.

Voltage or working pressure of control air to be specified at Order.

3. SIZES AND EXECUTIONS

SIZES:

Dimensions BxH to be defined by the Customer.

DRIVE:

EL24 - electric actuator 230V

EL230 - electric actuator 230V

PN - pneumatic actuator

MAN - manual

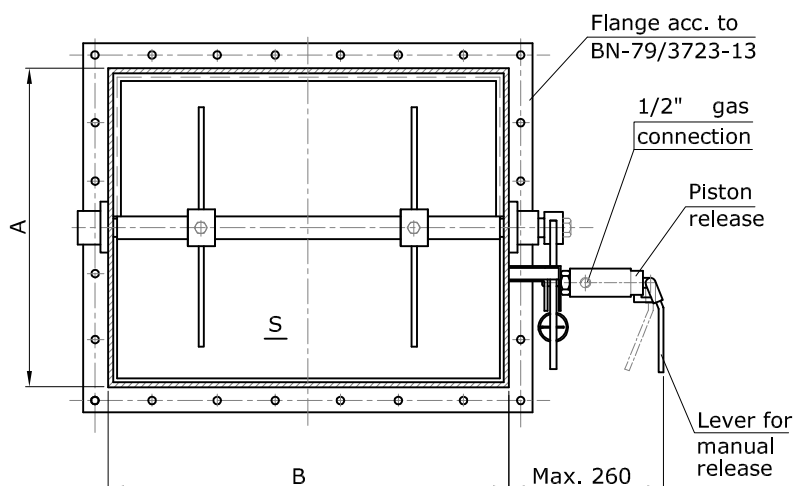
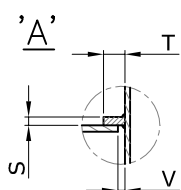
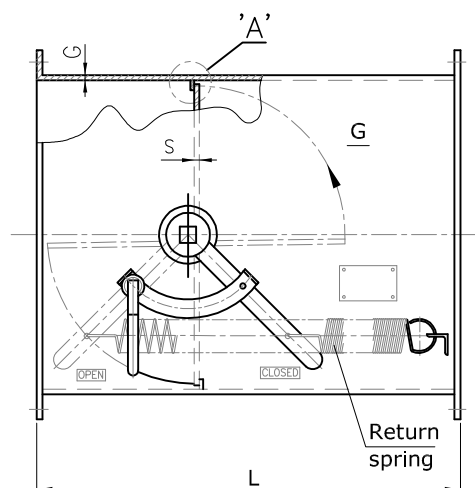
4. SURFACE TREATMENT

Hot-dip galvanised. Preservation with set of marine paints available on request.

5. MARKING

of marine cut-off damper COD of dimensions B=1000 mm, H=1200 mm, driven with electric actuator supplied with 230V:

CUT-OFF DAMPER COD-1000x120-EL230



A	B	L	G	S	T	V	Weight, kg	
100	100	250	3	4	10	5	5,9	
	160				15	7	6,5	
	200			7,2				
	250			5			7,7	
160	200	300	3	5	15	7	8,7	
	250						10,3	
	315		4		20	10	12,5	
	400						14,5	
200	250	350	3	5	15	7	9,4	
	315						13,4	
	400		4		20	10	16,3	
	500						19,8	
250	400	400	4	6	20	10	18,4	
	500		5				7	22,2
	630						26,7	
315	400	450	4	5	20	10	20,3	
	500		5	6			23,8	
	630			7			29,1	
	800			34,6				
400	500	500	5	6	20	10	26,1	
	630						33,4	
	800						38,7	

DESTINATION

The GFD marine cut-off dampers are designed for installation in ventilation ducts of gas-protected spaces (carbon dioxide, inergen, etc.). They prevent the spread out of gas through the ventilation ductwork to the adjacent compartments.

CONSTRUCTION

GFD cut-off dampers consist of flanged steel casing with isolating blade. Shaft bearings made of stainless steel, piston release - brass. Dampers are provided with a piston release actuated with gas utilised for flooding of protected area. In case of gas appearance the piston releases a spring that closes the damper. A hand lever enables to shut the damper manually.

SURFACE TREATMENT

Components of dampers are hot-dip galvanized.

MARKING

of GFD cut-off damper with dimensions BxA= 200x160 mm:

CUT-OFF DAMPER GFD 200x160

DESTINATION

The NDS noise damping fan socket is destined for installation in ventilation systems of sea-going ships and offshore objects.

They may be used as fire closure of main ventilation inlets and outlets as per SOLAS regulations, having also a function of attenuation of the fan generated noise.

CONSTRUCTION

The NDS sockets consist of steel flanged casing and rotary steel flap of thickness corresponding to requirements of regulations.

Shaft bearings provided with greasing nipples, maintenance-free bearings on request.

Lever for manual control with locking pin with chain.

Sockets are lined inside with sound-absorbing mineral wool, covered with perforated, galvanised steel sheet.

Sockets may be supplied with the premounted limit switches for remote indication of flap open-closed position.

SURFACE TREATMENT

Steel components of sockets are hot-dip galvanised. Painted with set of marine paints on request.

MARKING

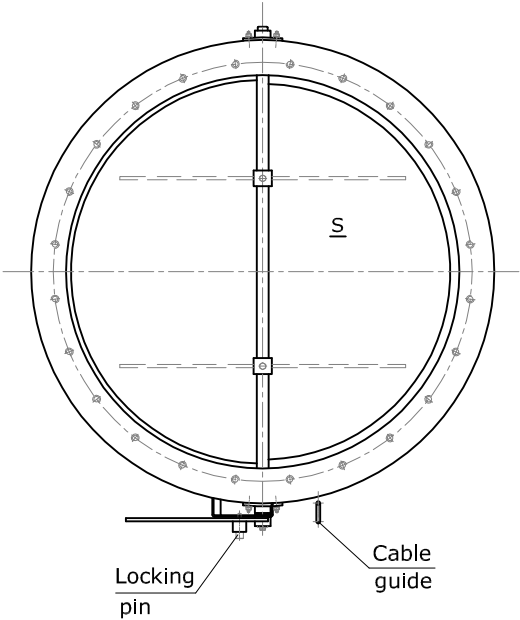
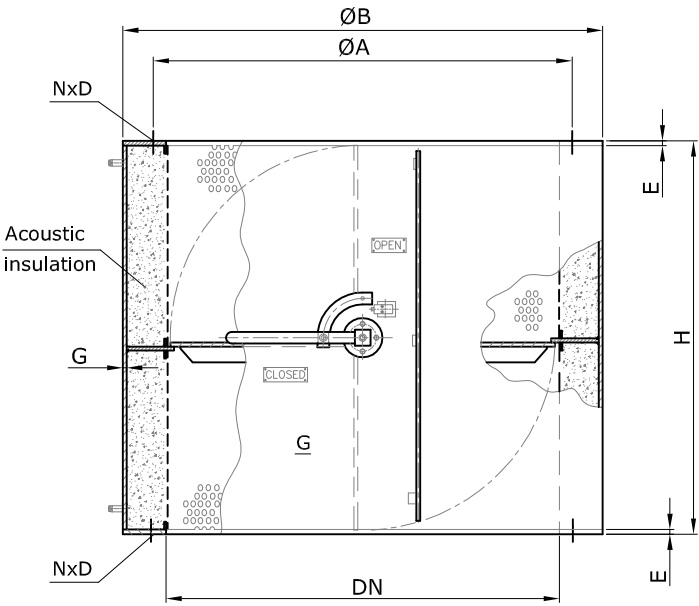
of NDS fan socket of nominal diameter DN=500:

NOISE DAMPING FAN SOCKET NDS-500

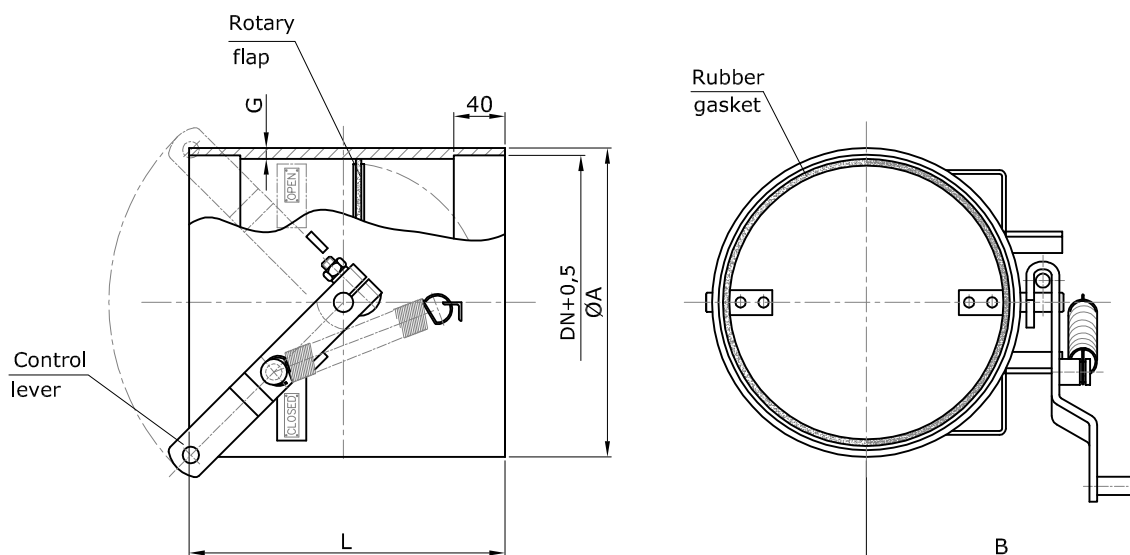
PERFORMANCE

Average values of noise attenuation:

Octave band Hz	dB
63	1
125	2
250	9
500	12
1000	10
2000	9
4000	7
8000	7



DN	A	B	NxØD	E	G	H	S	Weight, kg
500	560	720	16xM10	12	8	500	6	169
560	640	780	16xM12	12	8	560	6	186
630	695	850	16xM12	12	8	630	7	205
710	775	930	24xM12	12	10	710	7	294
800	865	1020	24xM12	12	10	800	7	390
900	965	1120	32xM12	12	10	900	8	485
1000	1065	1220	32xM12	12	10	1000	8	580
1120	1205	1340	24xM12	12	10	1120	8	710
1250	1335	1470	32xM12	12	10	1250	8	920
1400	1485	1620	24xM12	12	10	1400	8	1190
1600	1685	1820	32xM12	12	10	1600	8	1610



DESTINATION

The SD smoke dampers are destined for installation in ventilation and air conditioning systems of seagoing ships and offshore objects. They prevent the smoke and hot gases to spread-out through the pipework in case of fire.

CONSTRUCTION

SD smoke dampers consist of steel casing with spiro pipe connections on both ends and with manually operated, rotary flap peripheral sealed with rubber gasket.

Actual open/closed position of damper is secured with fixing spring and labelled on the housing.

Damper housing, flap and lever made of mild steel, shafts and bushings of stainless steel.

Tightness class 3 acc. to EN 1751/3.

DN	ØAxG	L	B	Weight, kg
80	86x3	120	110	1,08
100	106x3	120	125	1,32
125	131x3	130	140	1,95
160	166x3	140	160	2,68
200	206x3	160	185	4,05
250	256x3	180	210	6,10

SURFACE TREATMENT

Steel components of dampers are hot-dip galvanized. Painted with set of marine paints on request.

MARKING

of SD smoke damper of nominal diameter DN=160 mm:

SMOKE DAMPER SD-160

DESTINATION

The AP-type adaptor pieces are destined for direct connection of ALWO FDA automatic fire dampers (see ALWO/k3-04) with circular air pipework as Spiro piping (type S), thick-walled commercial marine pipes or bulkhead penetrations (type W) or or pipes joined with dstandarized ALWO flanges (type F).
pipes or bulkhead penetrations
Customised flanges dimensions on request.

CONSTRUCTION

The AP adaptor pieces are made of mild steel. Gasket made of non-combustible material and set of bolts and nuts included.

SURFACE TREATMENT

Steel components of adaptor piece painted with marine epoxy paint
Bolts and nuts - galvanised.

SIZES AND TYPES

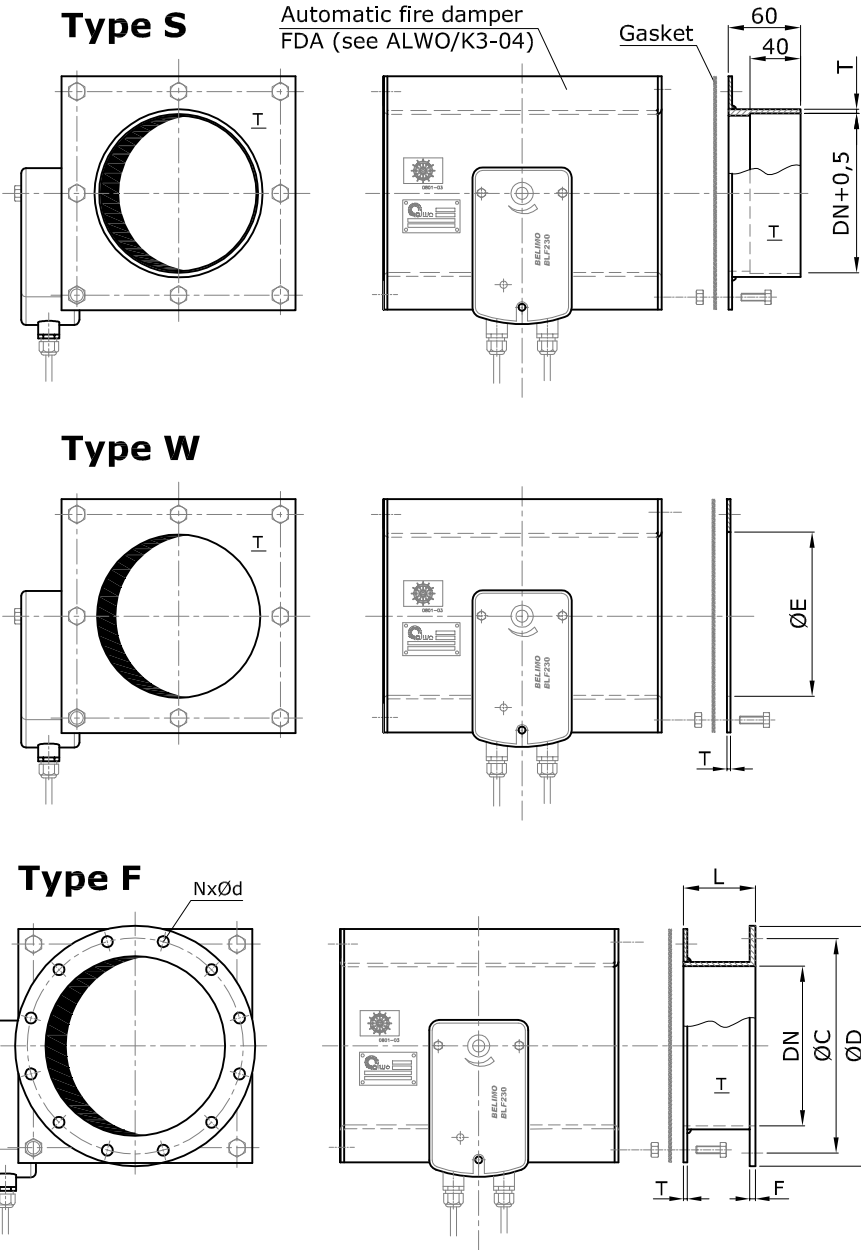
Nominal diameters - see Table
Types:

- S - for Spiro pipe connection
- W - for welding to thick-walled pipes
- F - for flanged pipe connection

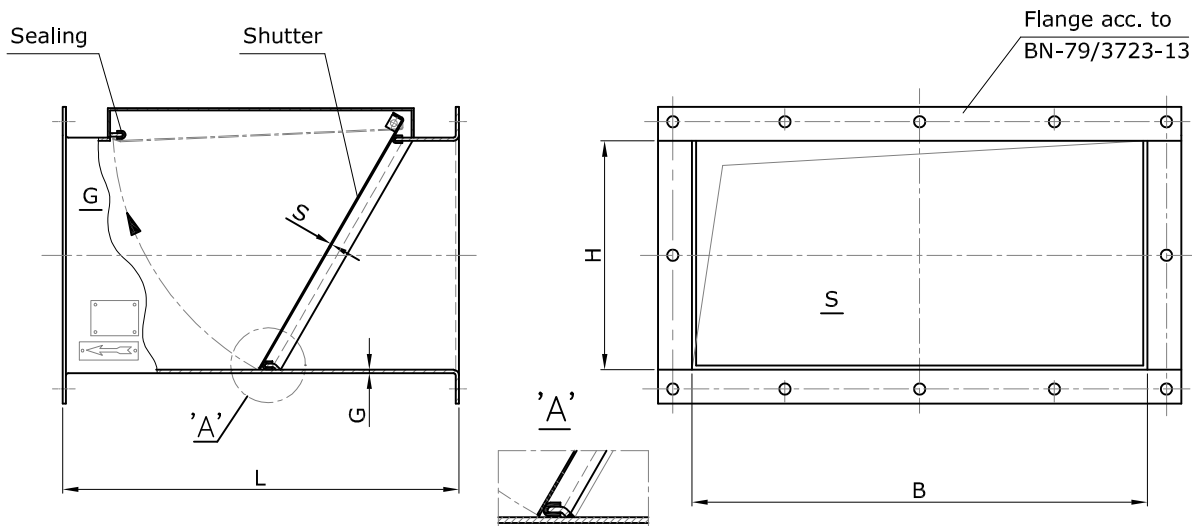
MARKING

for AP adaptor piece of nominal DN=125 and of type S::

ADAPTOR PIECE AP 125-S



FDA-AxB	DN	C	D	E	F	NxØd	L	T
100x100	100	160	190	110	5	8XØ12	50	3
125x125	125	185	215	135	5	8XØ12	50	3
160x160	160	220	250	170	5	8XØ12	50	3
200x200	200	260	290	221	5	8xØ12	50	3
250x250	250	310	340	250	5	8xØ12	50	3
315x315	315	370	405	325	5	12XØ12	50	3
400x400	400	460	490	400	5	12xØ12	50	4
500x500	500	560	590	500	8	16xØ12	60	4
560x560	560	640	690	560	8	16xØ14	60	5
630x630	630	695	730	630	8	16XØ14	60	5
710x710	710	775	810	710	8	24XØ14	60	5
800x800	800	865	900	800	8	24xØ14	60	5
900x900	900	965	1000	900	10	32xØ14	60	5
1000x1000	1000	1065	1100	1000	10	32xØ14	60	5



H	B	L	G	S	Weight, kg
100	100	240	2	1	3,5
	160				3,9
	200				4,4
	250				4,9
160	200	300	2	1	5,3
	250		3		6,1
	315				7,3
	400				9,1
200	250	350	2	1	5,5
	315		3		7,8
	400				9,7
	500				12,0
250	400	400	3	1	11,8
	500				13,3
	630				15,6
315	400	450	3	2	12,2
	500				14,1
	630		4		18,0
	800				19,8
400	500	560	3	2	17,3
	630		4		19,8
	800				22,5

1. DESTINATION

The NRV non-return flaps are destined for installation in ventilation ductwork of seagoing ships and offshore objects. They prevent the backflow of air through the ventilation ducts.

2. CONSTRUCTION

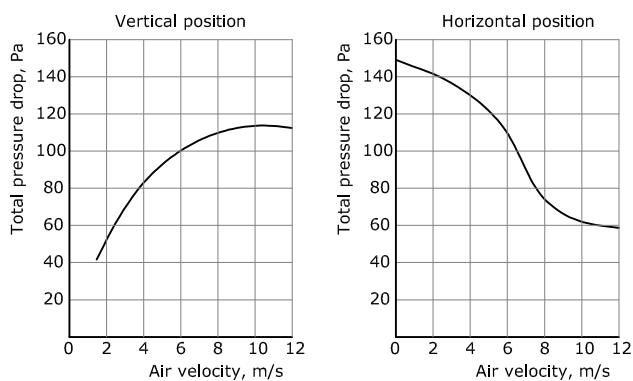
NRV non-return flaps consist of steel flanged casing with rotary shutting blade made of aluminium. Shaft bearings are made of stainless steel.

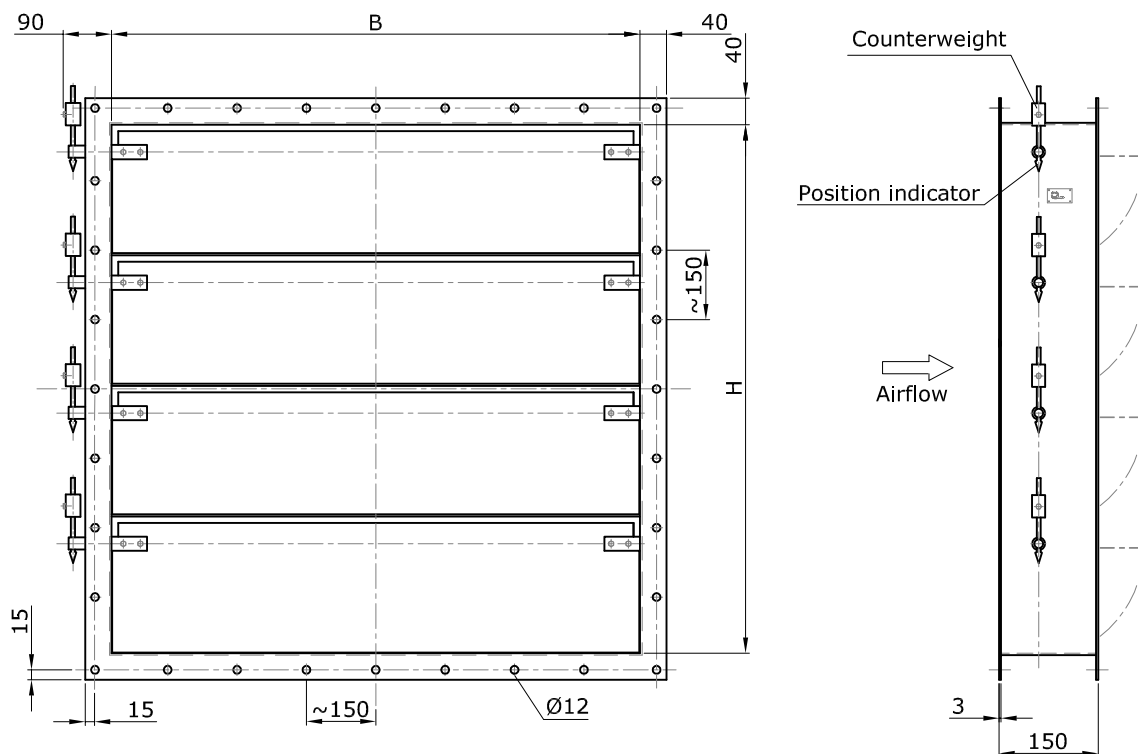
NRV flaps are to be installed in horizontal or vertical position.

At fitting of damper the airflow direction (arrow marked on the casing) is to be observed.

The air static pressure that opens the flap - see charts.

PERFORMANCE CHART





1. DESTINATION

The NRB non-return dampers are destined for installation in ventilation ductwork of seagoing ships and offshore objects. They prevent the backflow of air through the ventilation ducts.

2. CONSTRUCTION

NRB non-return dampers consist of steel flanged casing with rotary shutter blades made of steel sheet. Shaft bearings are made of stainless steel.

Blades edges provided with neoprene seals.

NRB dampers are to be installed in horizontal position.

At fitting of damper the airflow direction (arrow marked on the casing) is to be observed.

If required, dampers can be easily adjusted by the weights fitted to the blades shafts.

The dampers minimum opening force can be easily adjusted by the counterweights fitted to the blades shafts.

Standard position of counterweights on right hand side (shown on the drawing), left hand position available on request.

Maximum pressure across the dampers 4000 Pa, maximum air velocity 16 m/s.

3. SURFACE TREATMENT

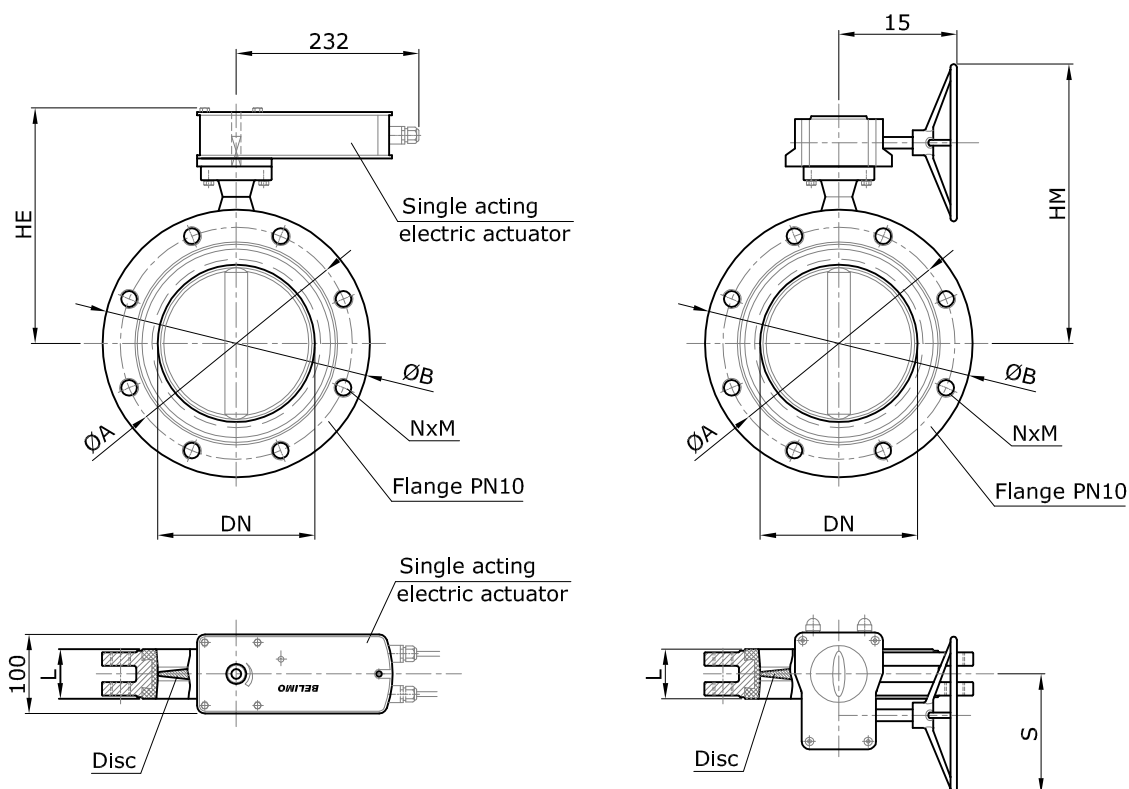
Steel components of dampers are hot-dip galvanized.

Dampers made of painted steel or stainless steel available on request.

4. MARKING

of NRB non-return dampers with dimensions BxH= 800x600 mm:

NON-RETURN DAMPER NRB-800x600



1. DESTINATION

The WTD watertight dampers are destined for installation in ventilation systems of ships and offshore objects as a watertight closure of ventilation ducts.

2. CONSTRUCTION

WTD watertight dampers consist of PN10 rated butterfly damper and manual, electrical alternatively pneumatic drive.
Leakproofness class - A
Medium temperature up to 70°C.
Maximum air flow 30m/s.
Hygienic attested by Polish Institute of Hygiene.

3. MATERIAL AND SURFACE TREATMENT

Body: Cast iron GG25
Disc: Bronze CuSn5ZnPb5-C
Packing: NBR
Shaft: Bronze CuAl10Fe3Mn2
Sleeves: Brass CuZn37
Coating: Epoxy painted RAL5005 250 µm
FKM or EPDM packing available on request.

DN	A	B	NxM	L	HE	HM	S	Weight, kg
150	285	240	8xM20	59	254	323	150	26
200	340	295	8xM20	63	286	355	150	31
250	395	350	12xM20	72	328	397	150	46
300	445	400	12xM20	82	358	427	150	63
350	505	460	16xM20	81	381	450	175	81
400	565	515	16xM24	106	411	505	175	120
500	670	715	20xM24	131	486	580	175	219

4. TYPES AND EXECUTIONS

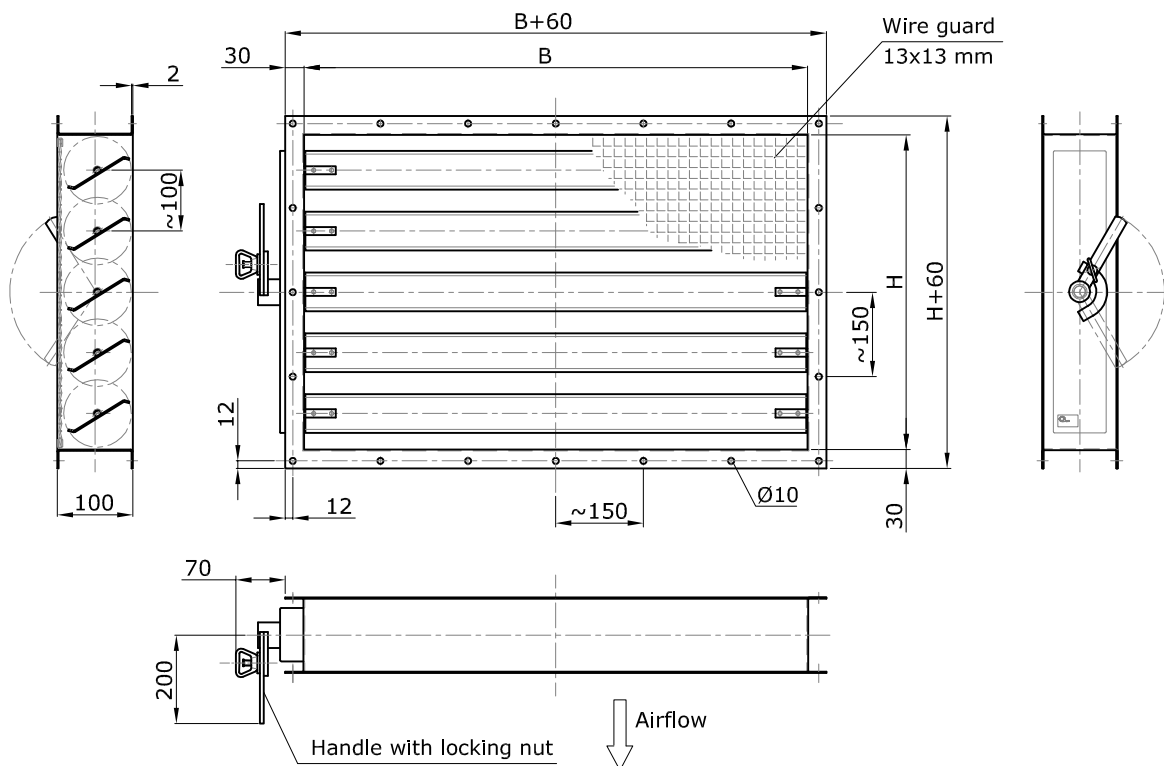
MAN manual, worm gear
EL230 electric actuator, 230 V
EL24 electric actuator, 24 V
PN pneumatic actuator, 6-8 bar

Electrically and pneumatically actuated may be supplied with electric OPEN/CLOSED position indicator (on request).

5. MARKING

of WTD watertight damper of nominal diameter DN200 and MAN manually operated:

WATERTIGHT DAMPER WTD 200 MAN



1. DESTINATION

The ADR diffuser louvre dampers are destined for installation in ventilation ductwork of seagoing ships and offshore objects. Enable adjustment of supplied air flow direction or closing of air supply.

2. CONSTRUCTION

ADR diffuser louvre dampers consist of flanged casing with rotary shutter blades made of galvanised steel sheet. Shaft bearings are made of stainless steel.

Blades can be fixed in any position between 0° (diffuser closed) and 130°.

Diffusers are provided with protecting wire guard fitted to air outlet side.

Maximum pressure across the dampers 1000 Pa, maximum air velocity 12 m/s.

3. SURFACE TREATMENT

Steel components of dampers are hot-dip galvanized.

Dampers made of painted steel or stainless steel available on request.

4. TYPES AND EXECUTIONS

- L handle situated at left side (shown on the drawing)
- R handle situated on right side

5. MARKING

of ADR non-return dampers with dimensions BxH= 800x600 mm, handle at left side L:

DIFFUSER LOUVRE DAMPER ADR-800x600-L