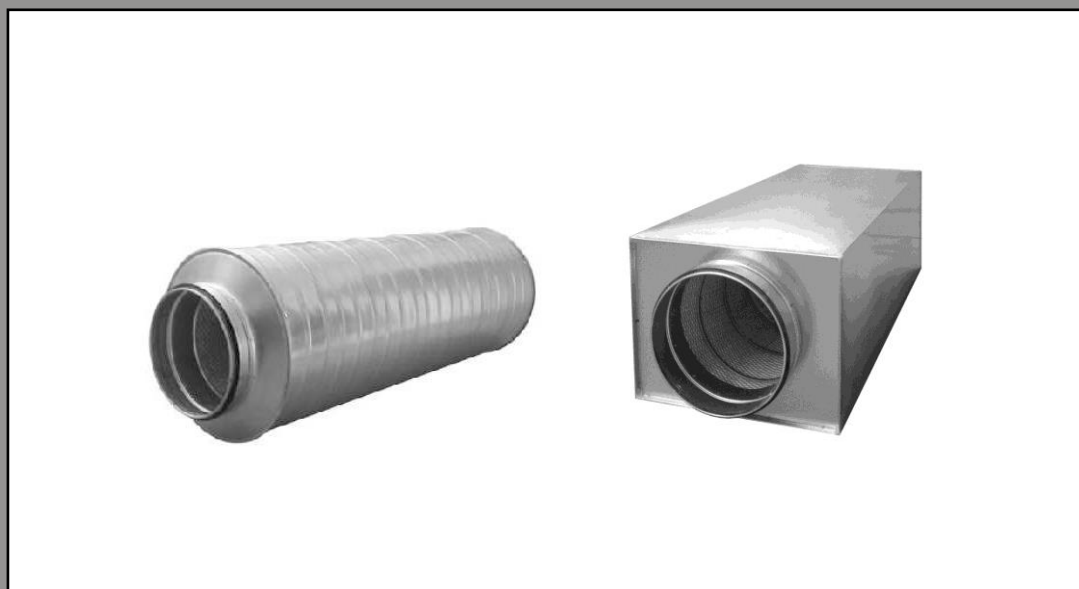


TOC / TOKC silencers

USER MANUAL

Wydanie: 08.12.2022



User manual for TOC/TOKC silencer



photo 1: TOC silencer



photo 2: TOKC silencer

Introduction

The instructions below are intended for installers, purchasers and future users of TOC/TOKC silencers. The manual includes information on the application, installation and operation of the silencers. Thoroughly read this manual before installation and use.

In case of damage or malfunction of the product, ask the manufacturer or its authorised representative about the possibility of installation or further use of the product.

The product meets the requirements of the current state of the art for mechanical ventilation systems, the requirements of the Swedish Technical Approval SC0234-16. The product satisfies the requirements set forth in chapter 8, 4 § 2, 3 PBL, in respect to and under conditions stated in this Technical Approval, and is therefore approved in accordance with the provisions of the following sections of Boverket Building Regulations (BBR) issued by the National Board of Housing, Building and Planning:

Fire resistance class E120	5:231
Fire technical alternatives ¹⁾	5:112 (BFS 2011:27, section 4.1.3)
Air handling installations	5:526
Material	6:11
Microorganisms ²⁾	6:24
Tightness ³⁾	6:255
Heating, cooling and handling installations	9:51

- 1) The product may be used where fire resistance class EI30 is required, if the distance to escape routes and to combustible materials for TOC silencer is 50 mm (according to report 5P00255-01 of 2015-05-07), whereas the safe distance for TOKC silencer is defined in Table 1:

Table 1. Safe distance for TOKC silencers measured in [mm].
According to report 5P00255-01 of 2015-05-07.

TOKC ϕ	b x h [mm]	L=500 [mm]	L=1000 [mm]
		Safe distance [mm]	
80	190 x 135	190	200
100	220 x 155	220	230
125	250 x 175	240	260
160	290 x 215	270	300
200	340 x 255	300	340
250	400 x 305	330	400
315	470 x 370	360	450
400	545 x 465	390	510

- 2) The **TOC** noise silencer **with 100 mm insulation** may be used where fire resistance class **EI 60** is required, if distances to evacuation routes, **distances** to combustible material are fulfilled as **in table 2**. According to report O100166 -1110397 of 2022-03-22.

Table 2. Safe distances from TOC silencers with 100 mm insulation. Distances to evacuation routes, distances to combustible material for fire resistance class EI 60.

Type	W (\varnothing D) [mm]	L [mm]			
		300	600	900	1200
		Safe distance [mm] Distances to evacuation routes, distances to combustible material for fire resistance class EI 60			
TOC ϕ 80/100	280	100	120	120	120
TOC ϕ 100/100	300	100	130	130	130
TOC ϕ 125/100	315	110	130	140	140
TOC ϕ 140/100	355	110	140	150	160
TOC ϕ 150/100	355				
TOC ϕ 160/100	355				
TOC ϕ 180/100	400	120	160	170	170
TOC ϕ 200/100	400				
TOC ϕ 224/100	400				
TOC ϕ 250/100	450	120	170	190	190
TOC ϕ 280/100	500	120	180	200	210
TOC ϕ 300/100	500				
TOC ϕ 315/100	500				
TOC ϕ 355/100	560	130	200	220	230
TOC ϕ 400/100	600	130	200	240	250
TOC ϕ 450/100	630	130	210	240	260
TOC ϕ 500/100	710	130	220	260	280
TOC ϕ 560/100	800	130	230	280	310
TOC ϕ 600/100	800				
TOC ϕ 630/100	800				

- 3) The air treatment unit or system must be fitted with filters, located upstream of the silencers, classified at least as F7 in accordance with EN 779. The product must not be installed in ducts intended for air transmission, containing greasy and viscous substances, e.g. in air exhaust ducts of kitchen hoods.
- 4) The ventilation duct system with an activated silencer shall be tested for tightness in accordance with EN 12237:2005. The system shall meet the requirements of tightness class A, B, C, D.

Technical assessment, certification, production supervision, integrity (E) testing and calculation of the safe distance for insulation (I) was performed by Technical Research Institute of Sweden.

TOC and TOKC silencers also meet the requirements of the following standards:

- EN 1506:2007 Ventilation for buildings – Sheet metal air ducts and fittings with circular cross section – Dimensions.
- EN 15727:2010 Ventilation for buildings – Ducts and ductwork components, leakage classification and testing.

The silencers meet the requirements of tightness class D according to EN 15727:2010 for external housing.

1. Product information.

TOC and TOKC silencers are intended for noise suppression in ventilation and air conditioning systems with circular cross-section. The silencer is installed upstream and downstream of the fan to reduce the noise that may be emitted to the system. It may also be installed in ducts serving for the neighbouring rooms or upstream of the boxes of supply diffusers and exhaust grilles, in order to avoid sound transmission through ducts. In this way, the installed silencers allow to maintain acoustic comfort in rooms when the ventilation system is in operation. An additional benefit of the TOKC silencer is its rectangular housing section which allows installation in low spaces between floor and suspended ceiling. Silencer housing is made of steel sheet with 275g/m² zinc coating with a minimum thickness of 20 µm acc. to EN 10346:2015. Corrosion resistance of the galvanised sheet until the first renovation, referred to the applied coating and environment corrosivity category C3 acc. to EN ISO 9223:2012, is minimum 10 years and maximum 28 years, counted in accordance with EN 14713-1:2017, which ensures a high level of corrosion resistance. Silencer housing maintains the tightness class D acc. to EN 15727:2010 at the overpressure of maximum 2000 Pa and vacuum of maximum 750 Pa. The given pressure range is the optimum range for TOC silencer operation. The sound absorption cartridge is formed by non-flammable mineral wool (minimum class A2-s1,d0 acc. to EN 13501-1:2019), covered on the airflow side with a textile fabric and galvanised mesh, which ensures protection against wool particle entrainment to fresh air. The maximum airflow speed should not exceed

12 m/s for acoustic reasons which produce own noise caused by the flow of air through the silencer. In other cases, the value of own noise may exceed the silencer's sound suppression capacity. The silencer is equipped with nipple connectors fitted with a lip seal made of EPDM synthetic rubber. The joint between the connector and duct or sleeve features tightness class D acc. to EN 12237:2005.

1.1. Range of TOC silencers with 50 mm insulation.

Type	ød [mm]	øD [mm]	Insulation thickness [mm]	L [mm]	Weight* [kg]
TOC φ80/50	78	180	50	300/600/900/1200	1,7/2,8/3,8/4,8
TOC φ100/50	98	200	50	300/600/900/1200	2,0/3,2/4,3/5,5
TOC φ125/50	123	224	50	300/600/900/1200	2,3/3,7/5,0/6,3
TOC φ140/50	138	250	50	300/600/900/1200	2,6/4,1/5,6/7,0
TOC φ150/50	148	250	50	300/600/900/1200	2,6/4,1/5,6/7,1
TOC φ160/50	158	250	50	300/600/900/1200	2,8/4,3/5,9/7,4
TOC φ180/50	178	280	50	300/600/900/1200	3,2/4,9/6,6/8,3
TOC φ200/50	198	300	50	300/600/900/1200	3,5/5,3/7,2/9,0
TOC φ224/50	222	315	50	300/600/900/1200	3,6/5,6/7,5/9,5
TOC φ250/50	248	355	50	300/600/900/1200	4,4/6,6/8,8/11,0
TOC φ280/50	278	400	50	600/900/1200	7,5/10,0/12,5
TOC φ300/50	298	400	50	600/900/1200	7,6/10,1/12,6
TOC φ315/50	313	400	50	600/900/1200	8,1/10,6/13,1
TOC φ355/50	353	450	50	600/900/1200	9,3/12,5/15,7
TOC φ400/50	398	500	50	600/900/1200	11,2/14,7/18,2
TOC φ450/50	448	560	50	600/900/1200	12,9/16,8/20,8
TOC φ500/50	498	600	50	600/900/1200	13,8/18,0/22,2
TOC φ560/50	558	710	50	600/900/1200	19,4/25,1/30,8
TOC φ600/50	598	710	50	600/900/1200	19,3/25,1/30,9
TOC φ630/50	628	710	50	600/900/1200	19,3/25,1/30,8

* Theoretic calculation of weight.

1.2. Range of TOC silencers with 100 mm insulation.

Type	$\varnothing d$ [mm]	$\varnothing D$ [mm]	Insulation thickness [mm]	L [mm]	Weight* [kg]
TOC $\varnothing 80/100$	78	280	100	300/600/900/1200	3,3/5,2/7,1/9,0
TOC $\varnothing 100/100$	98	300	100	300/600/900/1200	3,6/5,7/7,6/9,8
TOC $\varnothing 125/100$	123	315	100	300/600/900/1200	3,9/6,1/8,4/10,6
TOC $\varnothing 140/100$	138	355	100	300/600/900/1200	4,4/6,6/9,3/11,8
TOC $\varnothing 150/100$	148	355	100	300/600/900/1200	4,4/7,0/9,5/12,0
TOC $\varnothing 160/100$	158	355	100	300/600/900/1200	4,5/7,1/9,6/12,2
TOC $\varnothing 180/100$	178	400	100	300/600/900/1200	5,3/8,1/10,9/13,6
TOC $\varnothing 200/100$	198	400	100	300/600/900/1200	5,4/8,3/11,2/14,1
TOC $\varnothing 224/100$	222	400	100	300/600/900/1200	5,5/8,5/11,5/14,5
TOC $\varnothing 250/100$	248	450	100	300/600/900/1200	6,6/10,5/14,2/17,8
TOC $\varnothing 280/100$	278	500	100	600/900/1200	12,0/16,0/20,0
TOC $\varnothing 300/100$	298	500	100	600/900/1200	12,1/16,1/20,2
TOC $\varnothing 315/100$	313	500	100	600/900/1200	12,2/16,3/20,4
TOC $\varnothing 355/100$	353	560	100	600/900/1200	13,8/18,4/23,0
TOC $\varnothing 400/100$	398	600	100	600/900/1200	15,2/20,2/25,1
TOC $\varnothing 450/100$	448	630	100	600/900/1200	16,5/21,8/27,1
TOC $\varnothing 500/100$	498	710	100	600/900/1200	20,0/25,9/31,8
TOC $\varnothing 560/100$	558	800	100	600/900/1200	22,8/29,4/36,0
TOC $\varnothing 600/100$	598	800	100	600/900/1200	23,0/29,7/36,4
TOC $\varnothing 630/100$	628	800	100	600/900/1200	23,1/30,0/36,8

* Theoretic calculation of weight.

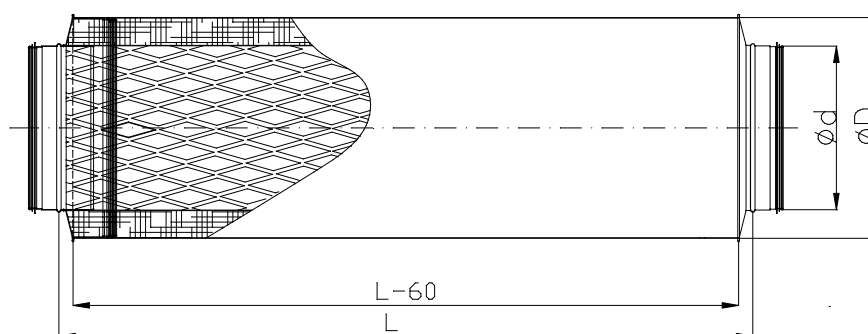


Fig. 1. TOC silencer.

1.3. Range of TOKC silencers.

Type	ød [mm]	bxh [mm]	L [mm]	Weight* [kg]
TOKC ø80	78	190x135	500/1000	3.2/5.6
TOKC ø100	98	220x155	500/1000	3.7/6.6
TOKC ø125	123	250x175	500/1000	4.3/7.6
TOKC ø160	158	290x215	500/1000	5.3/9.2
TOKC ø200	198	340x255	500/1000	6.3/11.0
TOKC ø250	248	400x305	500/1000	7.7/13.4
TOKC ø315	313	470x370	500/1000	9.6/16.4
TOKC ø400	398	545x465	500/1000	11.9/20.3

* Theoretic calculation of weight.

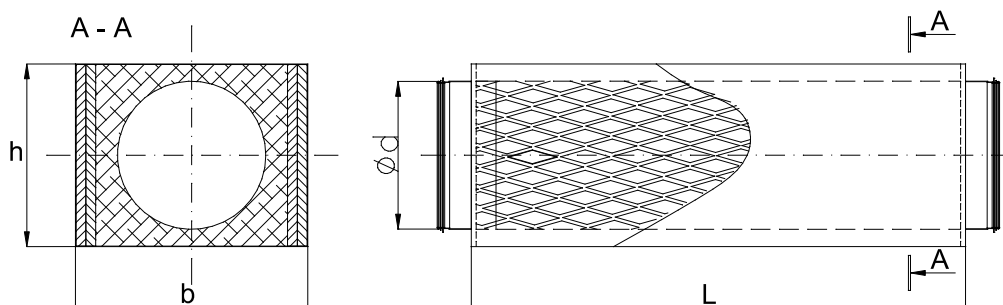






Fig. 2. TOKC silencer.

2. Rating plate – explanations.

2.1. TOC rating plate.

Approval holder	 83-236 Pogódki, Koźmin 30, Polska
Manufacturing site	
Boverket's registered trademark	
Certification body and accreditation number	
Product type designation	example TOC-630-900-50
Approval number	SC0234-16
Fire resistance class	E120
Consecutive manufacture No/date of production	number/date
Inspection body	RISE

2.2. TOKC rating plate.

Approval holder	 83-236 Pogódki, Koźmin 30, Polska
Manufacturing site	
Boverket`s registered trademark	
Certification body and accreditation number	
Product type designation	example TOKC-400-1000
Approval number	SC0234-16
Fire resistance class	E120
Consecutive manufacture No/date of production	number/date
Inspection body	RISE

3. Packaging.

For transport and storage, the silencer inlet pipes should be protected with foil to avoid penetration of atmospheric or construction dusts such as sand or water, e.g. during rain. During storage and transport, the silencers should be protected against rain or snow. Appropriate packaging will be selected based on the size and number of ordered silencers. It may be a cardboard or wooden pallet adapted in such a way that adjacent silencers remain fixed. Where it is possible that the product move inside the packaging, use separators made of cardboard or shock absorption foil to protect the silencer housing against abrasion.

4. Disposal.

The housing of the product is made of steel metal plates; therefore, it can be recycled. However, the insert that suppresses noise is made of mineral wool and is a waste. Used and dismantled product is to be disposed properly according to local regulations.

5. Rules of installation.

Silencers should be installed in accordance with the building practice, based on appropriate construction standards and regulations, to guarantee firm connection with the ducts and stable support and connection with the structure of walls and building floors which will transfer the load exerted by the system of ducts equipped with silencers and other components. When using suspensions and supports for ventilation ducts, it is required to include the strength requirements contained in EN 12236:2003 standard. The design of the building structure and its systems should include details

for assembly and appropriate selection of supports or suspensions for the loads resulting from the weights of ventilation system components. The standard mentioned above provides for the safety factor of minimum three for support components selected to install the ducts at the building structure. Distance between the supports should take into account the strength of the supports alone, strength of the ducts, and should ensure that duct deflection will not materially affect the tightness of joints, flow properties of the air and will not disturb the duct network structure. The manufacturer recommends supporting the silencers near the connectors, as presented in the drawings below. When connecting a silencer connector with the duct by sliding, prevent possible sliding out using sheet metal screws, whose number should be based on the joint diameter. Pay attention to arrange the sheet metal screws evenly at the connection circumference and to tighten the screws in such a way as to avoid contact with the seal installed at the silencer connector. Seals damaged during installation do not guarantee tightness of joints, and in such a case the manufacturer is not liable for the product so damaged.

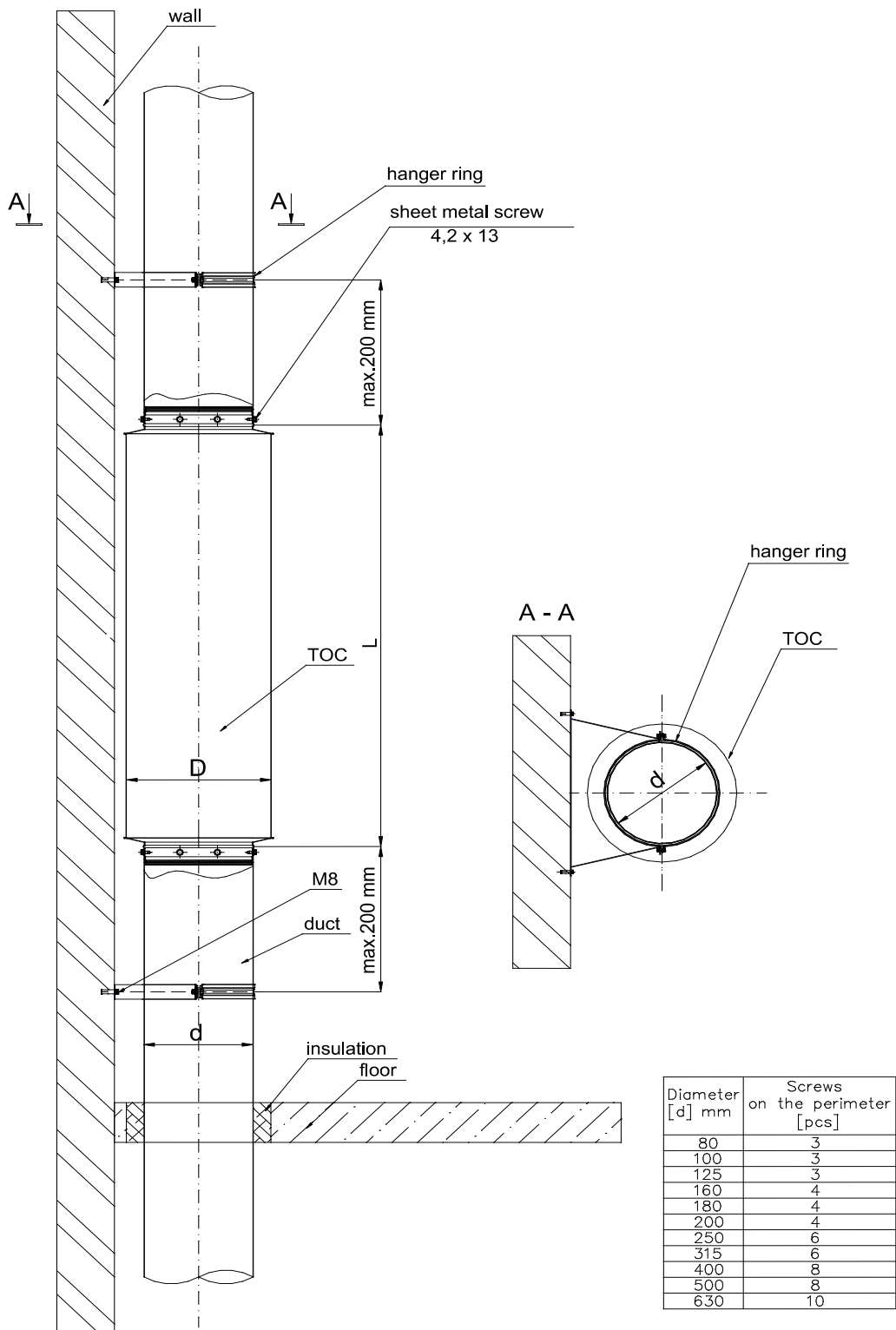


Fig. 3. Vertical installation of TOC silencer.

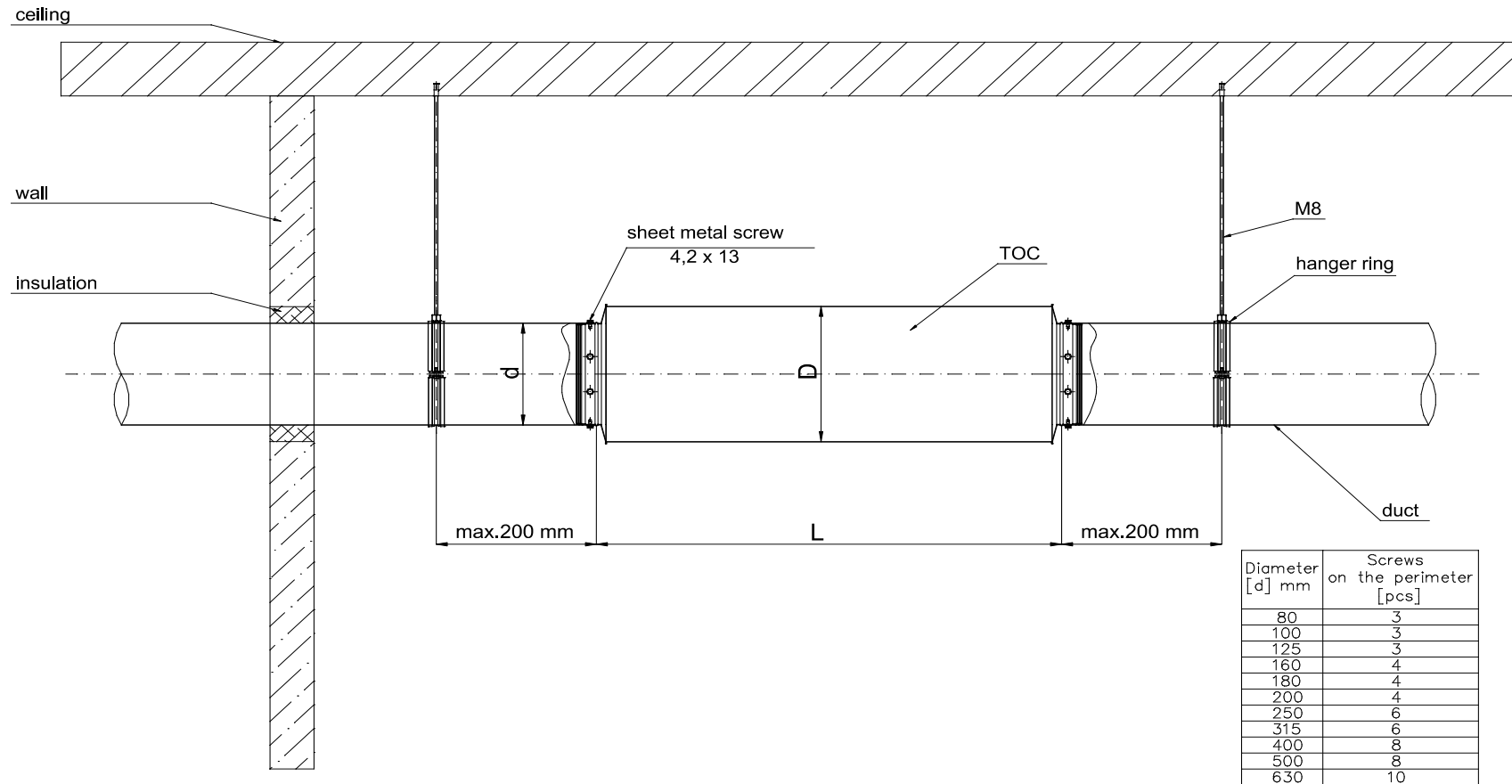


Fig. 4. Horizontal installation of TOC silencer.

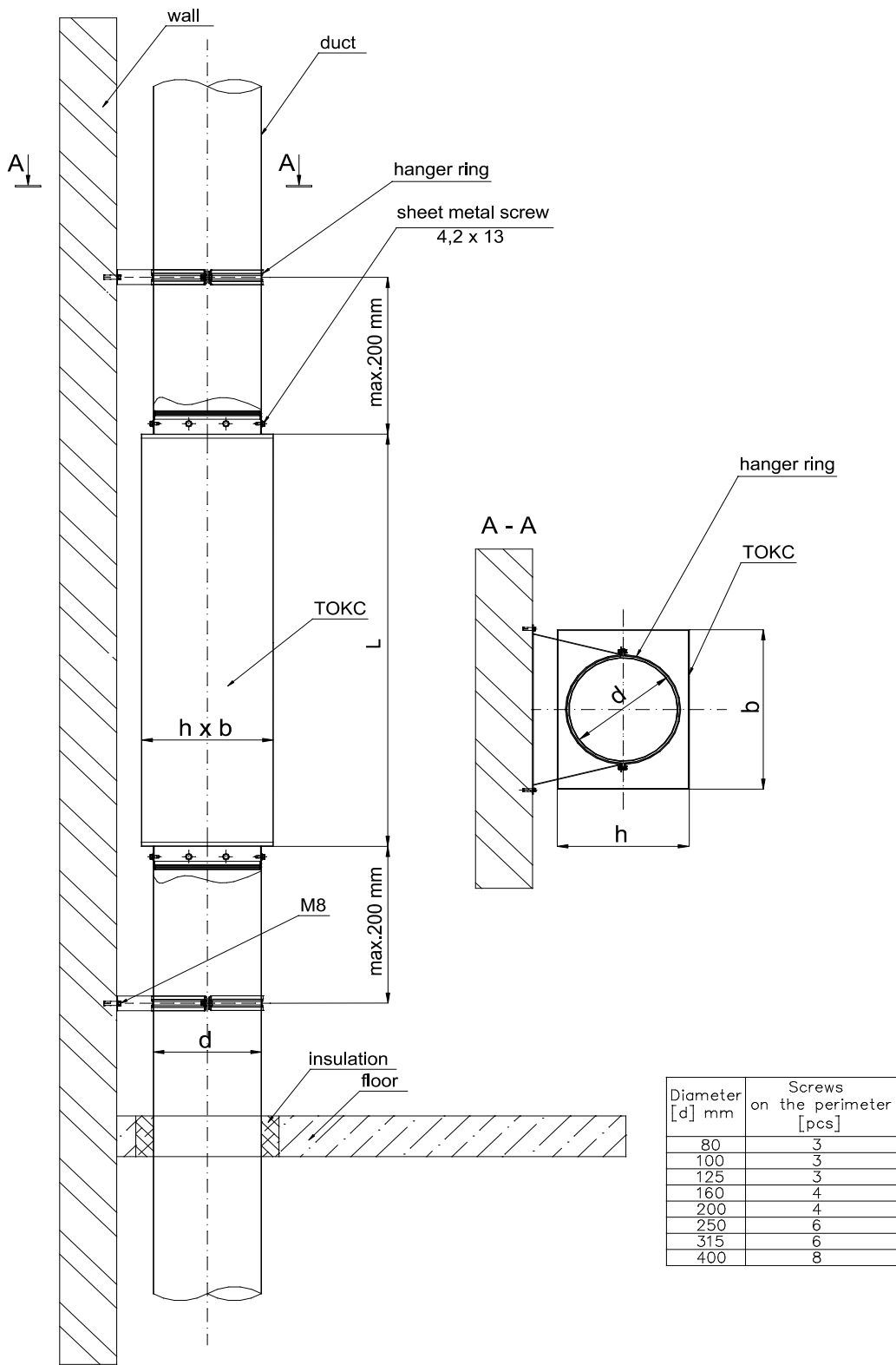


Fig. 5. Vertical installation of TOKC silencer.

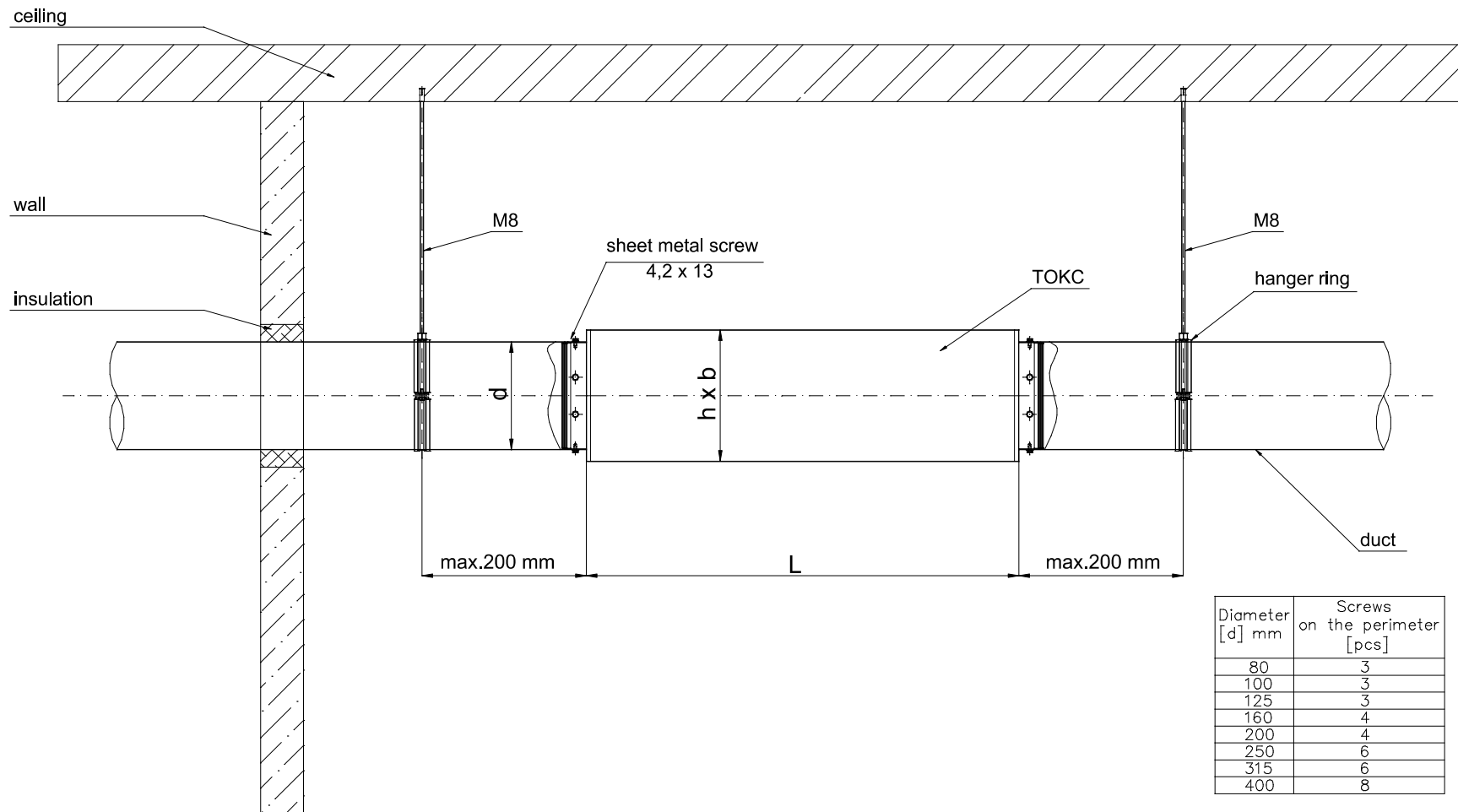


Fig. 6. Horizontal installation of TOKC silencer.

The product may be installed where flame resistance EI30 is required, if the distance to escape routes, and to inflammable materials for TOC silencer is 50 mm. TOC noise silencer with 100 mm insulation may be used where fire resistance class EI 60 is required, if distances to evacuation routes, distances to combustible material are fulfilled as in table 2 in introduction .

The safe distance for TOKC silencer is defined in Table 1 in introduction . In this case, the installer should place a warning sign at the silencer housing, in a visible location. The model warning sign is presented below.



Fig.7 Warning sign.

6. Rules of maintenance, cleaning and periodic servicing.

Inspection and cleaning interval: according to: VDI 6022, EN 15780 and local regulations.

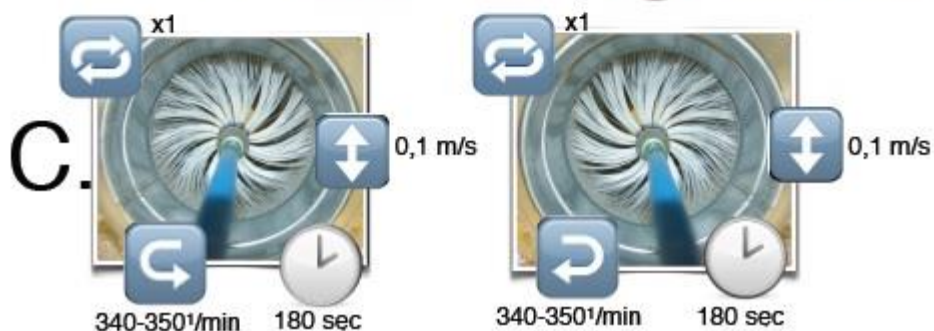
Cleaning method: dry brushing, using continuous air extraction from one side. Brush material: Nylon, very soft only, with rounded hair edges. Brushes with sharp edges must not be used.

Disinfection method: only safe dry methods are applicable. No wet disinfection allowed. Consult the building operator as well as manufacturer of disinfectant or manufacturer of the noise silencer for details of application. Use only agents certified for use in human occupied spaces. Observe safety precautions. Check for ventilation air contamination with disinfecting agents after use.

After brushing allow several minutes of air extraction to remove all debris before checking the results. After disinfection allow enough time to eliminate any disinfecting agents from ventilation air. Again, check for ventilation air contamination with disinfecting agents after use.

Use protective clothing, hand, eye and respiratory ways protection.

See recommendations below for details. In case of any doubts ask the manufacturer of the silencer.



Declaration of Conformity

1. Product: covered by the technical documentation and product catalogue of Ciecholewski-Wentylacje Sp. z o.o.:
 - TOC silencer
 - TOKC silencer
2. Product classification: Polish Classification of Goods and Services (PKWiU) 28.75.27-49 Steel products, other.
3. Scope of application: Mechanical ventilation and air conditioning systems for ducting of fresh air to ensure air change in buildings intended for public utility, housing, industry, healthcare and pharmacy, food and electronic industry and offshore structures.
4. Reference documents:

Ciecholewski-Wentylacje Sp. z o.o. declares the conformity of the product with the below Standards and Technical Documentation:

The product meets the requirements of the current state of the art for mechanical ventilation systems, the requirements of the Swedish Technical Approval SC0234-16*, has been approved in accordance with the Boverket Building Regulations (BBR) issued by the Swedish National Council for Housing and Planning, and meets:

Fire resistance class E120	5:231*
Fire technical alternatives ¹⁾	5:112* (BFS 2011:27, section 4.1.3)
Air handling installations	5:526*
Material	6:11*
Microorganisms ²⁾	6:24*
Tightness ³⁾	6:255*
Heating, cooling and handling installations	9:51*

4.1) The product may be used where fire resistance class EI30 is required, if the distance to escape routes, and to inflammable materials for TOC silencer is 50 mm (according to the report 5P00255-01 made on 2015-05-07)*, whereas the safe distance for TOKC silencer is defined in Table 1:

Table 1. Safe distance for TOKC silencers measured in [mm]. According to the report 5P00255-01 made on 2015-05-07*.

TOKC ϕ	b x h [mm]	L=500 [mm]	L=1000 [mm]
		Safe distance [mm]	
80	190 x 135	190	200
100	220 x 155	220	230
125	250 x 175	240	260
160	290 x 215	270	300
200	340 x 255	300	340
250	400 x 305	330	400
315	470 x 370	360	450
400	545 x 465	390	510

4.2) The **TOC** noise silencer **with 100 mm insulation** may be used where fire resistance class **EI 60** is required, if distances to evacuation routes, **distances** to combustible material are fulfilled as **in table 2**. According to the report O100166 - 1110397 made on 2022-03-22*.

Table 2. Safe distances from TOC silencers with 100 mm insulation. Distances to evacuation routes, distances to combustible material for fire resistance class EI 60. According to the report O100166 -1110397 made on 2022-03-22*.

Type	W (\pm D) [mm]	L [mm]			
		300	600	900	1200
		Safe distance [mm] Distances to evacuation routes, distances to combustible material for fire resistance class EI 60			
TOC ϕ 80/100	280	100	120	120	120
TOC ϕ 100/100	300	100	130	130	130
TOC ϕ 125/100	315	110	130	140	140
TOC ϕ 140/100	355	110	140	150	160
TOC ϕ 150/100	355				
TOC ϕ 160/100	355	120	160	170	170
TOC ϕ 180/100	400				
TOC ϕ 200/100	400				
TOC ϕ 224/100	400	120	170	190	190
TOC ϕ 250/100	450				
TOC ϕ 280/100	500				
TOC ϕ 300/100	500	120	180	200	210
TOC ϕ 315/100	500				
TOC ϕ 355/100	560				
TOC ϕ 400/100	600	130	200	240	250
TOC ϕ 450/100	630	130	210	240	260
TOC ϕ 500/100	710	130	220	260	280
TOC ϕ 560/100	800	130	230	280	310
TOC ϕ 600/100	800				
TOC ϕ 630/100	800				

4.3) The air treatment unit or system must be fitted with filters, located upstream the silencers, classified at least as F7 in accordance with EN 779. The product must not be installed in ducts intended for air transmission, containing greasy and viscous substances, e.g. in air exhaust dusts of kitchen hoods.

4.4) The ventilation duct system with an activated silencer shall be tested for tightness in accordance with EN 12237. The system shall meet the requirements of tightness class A, B, C, D.

4.5) Technical assessment, certification, production supervision, integrity (E) testing and calculation of the safe distance for insulation (I) was performed by RISE Technical Research Institute of Sweden AB* .

4.6) TOC and TOKC silencers also meet the requirements of the following European standards:

- EN 1506:2007 Ventilation for buildings — Sheet metal air ducts and fittings with circular cross-section — Dimensions.

- EN 15727:2010 Ventilation for buildings — Ducts and ductwork components, leakage classification and testing.

The silencers meet the requirements of tightness class D.

5. Declared material properties: TOC and TOKC silencers are made of galvanised steel sheet, grade DX51D+Z 275 MAC, and non-flammable mineral wool.
6. I declare with full responsibility that the products included in the Declaration, listed in point 1, are in conformity with the reference documents listed in point 4.

Koźmin, 08-12-2022 r.

Signature of authorised person:

Pełnomocnik Zarządu ds. SZJ
Quality Manager

Izabela Jagiello

* concerns the conformity of the product with the national standards of Sweden