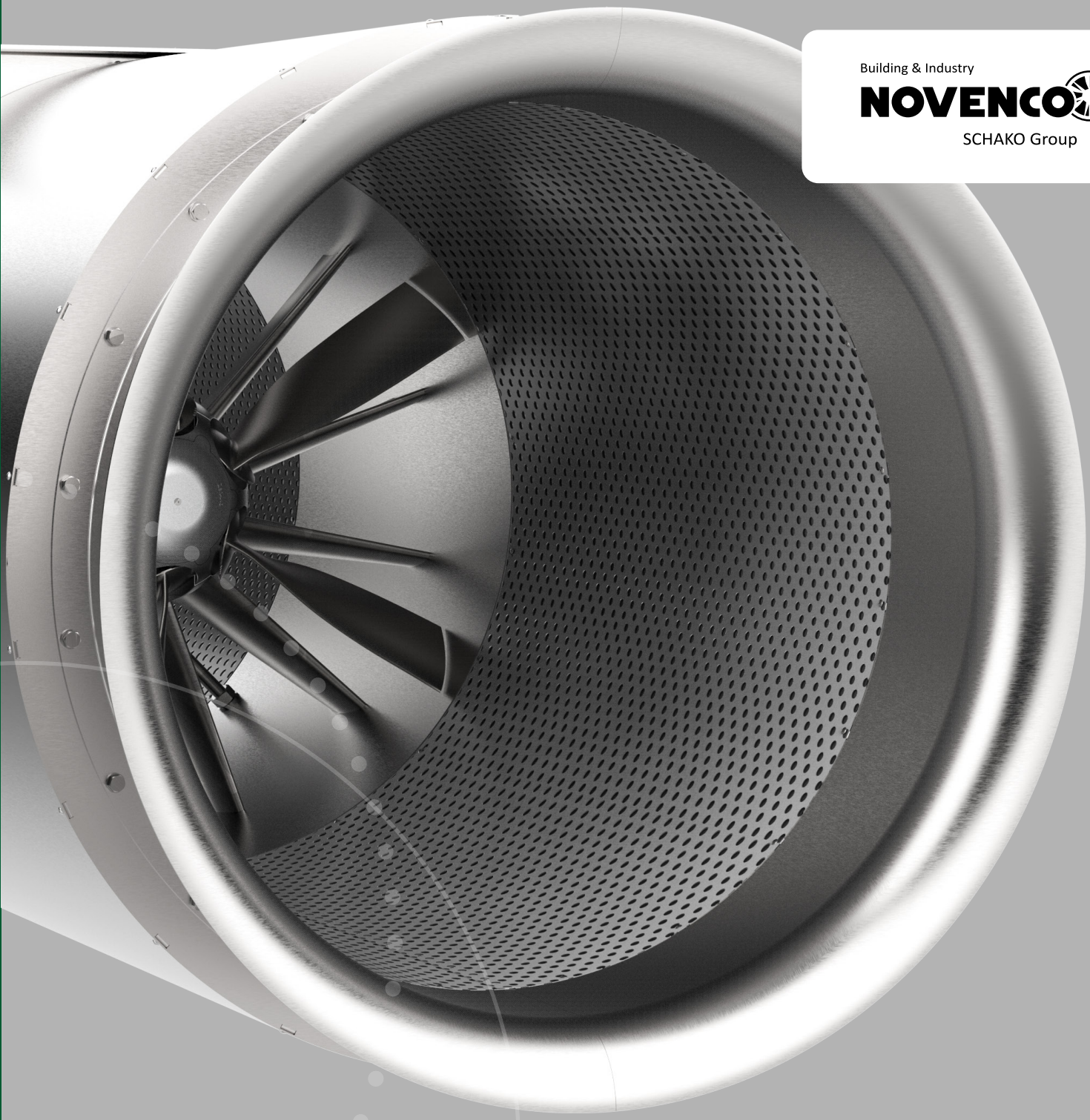


Building & Industry

NOVENCO

SCHAKO Group

NOVENCO® Tunnel fans

Hot smoke

above ErP compliance

EN 12101-3:2015 certified

Product facts

Products

Novenco® tunnel fan types are available in unidirectional (AUC, AUR and AUZ) and reversible (ARC and ARR) versions.

- AUC/ARC- rectangular with silencers and Novenco NovAx™ fans
- AUR/ARR- round with silencers and Novenco NovAx fans
- AUZ- round with silencers and Novenco ZerAx® fans

Applications

The fans are for ventilation of tunnels with harsh environments such as road and train traffic, where they provide an effective way of handling polluted air and smoke.

Ranges

The Novenco tunnel fans are available in the following sizes.

	øD [mm]
AUC/ARC	ø630, ø710, ø800
AUR/ARR	ø630, ø710, ø800, ø1000, ø1120, ø1250, ø1400, ø1600
AUZ	ø900, ø1000, ø1120, ø1250

Internal duct diameters

Construction

The tunnel fans are tube constructions with fan casings in the middle. Silencers are mounted on both the inlet and outlet sides. The fan casing material is 3 to 4 mm thick. All fans include suspension brackets for direct mounting to straight ceilings.

Motors

Dimension standard: IEC 60034
Efficiency classes: IE3 as standard and IE4 for 75 kW motors and above
Electrical standard: IEC 60034
Enclosure: Min. IP55 in accordance with IEC 34-5 — increased protection classes available on request
Insulation: Class H
Motor flanges: B5 (standard) or B14 in accordance to IEC 34-7
Mounting: Flange
Speed control: Direct on line (DOL)
Terminal boxes: Steel boxes mounted on outside of fan casings
Terminal boxes, enclosure: IP66
Voltages: 3x400 V, 50 Hz — other voltages and frequencies available on request

Novenco impellers

The motors are direct-coupled to the impellers. The type of impeller depend on the type of fan; the AUC/ARC and AUR/ARR employ NovAx impellers while the AUZ uses ZerAx impellers. Both impeller types consist of two hub discs with cavities, in which the blades are mounted in pre-calculated angles.

Materials

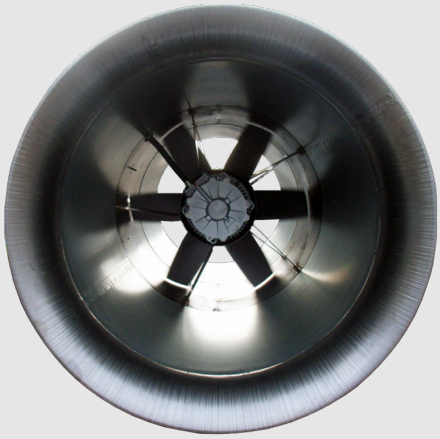
Blades: Aluminium alloy
Casings and motor suspension: Welded steel plate, metallic coated
Cones: Metallic coated steel sheet
Deflectors: Aerodynamic shaped aluminium wings in steel brackets
Hubs: NovAx: Metallic-coated steel sheet, optionally epoxy coated; ZerAx: Aluminium
Inside tube for silencers: Perforated stainless steel plate
Silencers: Metallic coated steel sheet
Sound attenuating material: Fire-proof and moisture resistant
Suspension brackets: Metallic coated steel sheet
Wire guards: Stainless steel
Other materials: Available on request, f.x. stainless steel

Classifications

Balancing of impeller unit: VDI 2060, ISO 21940-11, balance quality grade G 6.3
Corrosion categories: C3 as standard, C4 or C5 as options
Environment: Meets the requirements for operation in industrial and coastal areas with moderate salinity according to EN ISO 12944-2
Fan aerodynamic performance: EN ISO 13350
Flange standards: Eurovent 1/2
High temperature approvals:
AUC/ARC-AUR/ARR: Certified as $F_{200}120$, $F_{300}60$, $Ff_{300}120$ or $F_{400}120$ class fans according to EN 12101-3 and tested for two hours at 300 or 400 °C, respectively.
AUZ: Certified as $F_{200}120$, $F_{300}60$, or $Ff_{300}120$ class fans according to EN 12101-3 and tested for two hours at 300 °C.
Sound performance: ANSI/AMCA 300-14
Technical capacities: ISO 21940-11; ISO 21940-14; EN ISO 5801
Temperature range:
AUC/ARC-AUR/ARR: -20 to +60 °C
AUZ: -20 to +40 °C

Accessories

- Adjustable deflectors on outlets
- Painted- inside, outside or both
- Safety chains
- Space heaters
- Temperature sensors on bearings
- Temperature sensors on motor windings
- Vibration dampers
- Vibration sensors
- Wire guards on inlets



Tunnel fan type ARR

NOVENCO Tunnel fans

The high performance and high temperature resistant tunnel fans from Novenco are true 2-in-1 fans. In situations where ventilation requirements are within normal conditions, they deliver effective ventilation of railway and road traffic tunnels. If disaster strikes, they react quickly and provide superior control of smoke-filled areas as an invaluable aid for firefighters.

Novenco tunnel fans are part of tunnel designs around the world and ensure energy-savings, low sound levels and good system efficiencies.

Main characteristics

- Compact construction
- High efficiency
- High temperature resistance
- Low installation height
- Low sound

Design

The fan shapes consume a minimum of materials, and offer optimal and efficient characteristics. The designs are available as round or rectangular executions.

Materials

The environments and harsh conditions tunnel fans operate in, put high strains on the strength and quality of the fans. Novenco tunnel fans are therefore mostly made of metallic-coated or stainless steel sheets, and with blades and deflectors of aluminium. Attenuating silencer material is fire-proof and moisture resistant.

Unquestionable performance

The specifications of the Novenco tunnel fans allow for efficient and reliable normal operation. In case of fire, the fans have sufficient capacities for smoke control. The exact capacities depend on the tunnel layout and on the specific standards and regulations that apply. Novenco's experience with tunnel fan design, system layouts and calculations is decades long and from a wide range of projects.

Renowned fan quality

The Novenco tunnel fan ranges employ the Novenco NovAx and the Novenco ZerAx axial fans. The NovAx fan design is from the 1980s and is both durable and efficient and has been revised numerous times to meet market requirements. The ZerAx fan design is from 2010 and is unsurpassed in terms of efficiency. It too receives regular revisions to be in compliance with market demands.

Approved for high temperatures

The performance of the tunnel fans has been verified in accordance with legislative requirements and standards. The fans are tested and certified for operation as EN 12101-3 hot smoke fans.

Product description

Fan types

The tunnel fans are manufactured in round (AUR/ ARR and AUZ) and rectangular (AUC/ARC) space-saving designs in either unidirectional or reversible versions. The impellers range in diameter for round designs from ø630 to ø1600 mm for AUR-ARR and from ø900 to 1250 mm for AUZ. For rectangular designs the range is from ø630 to ø800 mm for AUC-ARC.

Fan casings

The fan casings are welded steel constructions in 3 or 4 mm metallic-coated steel sheet depending on size. Alternatively, the casings can be made in stainless steel.

Motors

These are as standard IEC motors for 50 or 60 Hz in efficiency class IE3 as standard and IE4 for 75 kW motors and above. Minimum protection class is IP55 with increased protection classes available on request.

Electrical connections

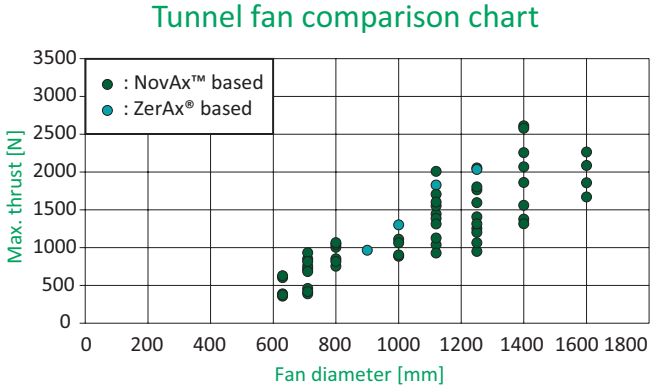
All tunnel fans have terminal boxes and disconnect switches on the outside of the fan casings.

Installation

The tunnel fans are for ceiling installation on straight surfaces. However, brackets for other ceiling profiles are also available.

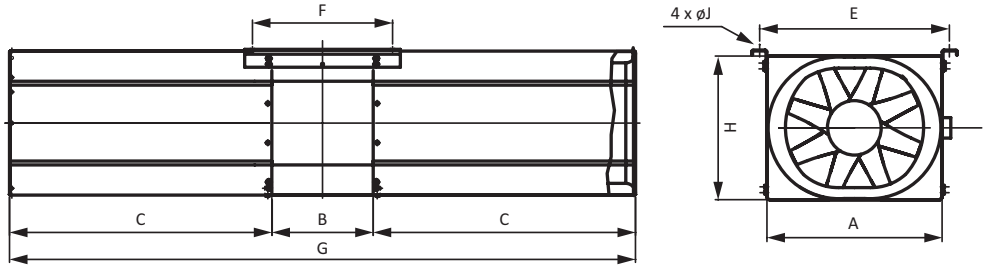
Temperature ranges

The fans are for continuous operation at -20 to +60 °C (AUR/ ARR and AUC/ARC) and at-20 to +40 °C (AUZ) and tested and certified for smoke and heat exhaust at either 300 or 400 °C during 2 hours of operation. At 400 °C, some fan sizes operate at reduced speeds.



Tunnel fan comparison chart

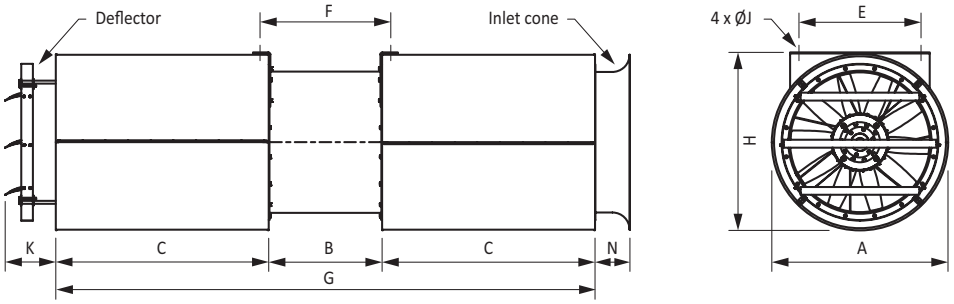
Dimensions



Fan size, øD [mm]	A [mm]	B [mm]	C [mm]	E [mm]	F [mm]	G [mm]	H [1] [mm]	øJ [mm]
630	820	612	1350	895	580	3312	670	24
710	900	612	1350	975	720	3312	750	24
800	990	520	1350	1065	720	3220	840	24

AUC-ARC ø630 - ø800 – unidirectional and reversible

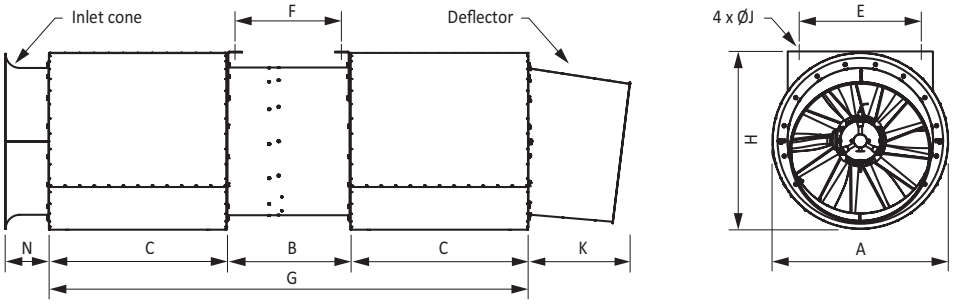
Shown fan
AUR with optional deflector



Fan size, øD [mm]	øA [mm]	B [mm]	C [mm]	E [mm]	F [mm]	G [mm]	H [1] [mm]	øJ [mm]	K [2] [mm]	N [3] [mm]
630	840	650	1220	700	750	3090	850	24	300	200
710	920	650	1220	700	750	3090	930	24	300	200
800	1010	650	1220	700	750	3090	1020	24	300	200
1000	1210	850	1220	900	950	3290	1220	24	300	200
1120	1330	850	1220	900	950	3290	1340	24	300	200
1250	1460	850	1220	900	950	3290	1470	24	300	200
1400	1610	1120	1220	1300	1220	3560	1620	24	300	200
1600	1810	1120	1220	1300	1220	3560	1820	24	300	200

AUR-ARR ø630 - ø1600 – unidirectional and reversible

Shown fan
AUZ in standard configuration



Fan size, øD [4] [mm]	øA [mm]	B [mm]	C [mm]	E [mm]	F [mm]	G [mm]	H [1] [mm]	øJ [mm]	K [mm]	N [mm]
900	1115	850	1220	900	718	2850	1120	24	700	200
1000	1215	850	1220	900	718	2850	1220	24	700	200
1120	1335	850	1220	900	718	2850	1340	24	700	200
1250	1465	850	1220	900	718	2850	1470	24	700	200

AUZ ø900 - ø1250 – unidirectional

1. Heights include fans with installation brackets. Vibration dampers increase the height by 20 mm.
2. The deflectors are optional. On the reversible ARR the deflectors are mounted on the inlet cones.
3. The inlet cones are standard.
4. Inlet cones are available in two sizes. Dimensions for small sizes are on left in two-value cells.

Performance data and weights

Fan type	Meas. thrust [N]		Motor rating [kW]	Thrust efficiency [N/kW]		Current [A] [3]	Outlet velocity [m/s]		Sync. speed [RPM]	Sound pressure level [dB(A)] [1]		Estimated total weight [2] [kg]
	F300	F400		F300	F400	400 V, 50 Hz	F300	F400		F300	F400	
AUC 630/280-8	360 609	353 596	12.7 28.0	29 22	29 21	23 50	31 40	31 40	3000	64 68	65 69	430 500
AUC 710/280-8	381 760	373 744	12.7 28.0	31 28	30 27	23 52	28 40	28 40	3000	66 70	67 71	510 580
AUC 710/330-10	859	841	40.0	22	21	72	43	42	3000	72	73	630
AUC 800/280-8	740	-	28.0	27	-	50	35	-	3000	72	-	630
AUC 800/330-10	963	-	40.0	25	-	72	40	-	3000	73	-	680

Uni-directional tunnel fans type AUC

Fan type	Meas. thrust [N]		Motor rating [kW]	Thrust efficiency [N/kW]		Current [A] [3]	Outlet velocity [m/s]		Sync. speed [RPM]	Sound pressure level [dB(A)] [1]		Estimated total weight [2] [kg]
	F300	F400		F300	F400	400 V, 50 Hz	F300	F400		F300	F400	
AUR 630/280-8	380 644	372 631	12.7 28.0	31 23	30 23	23 50	32 42	32 41	3000	67 70	68 71	270 340
AUR 710/280-8	450 764	441 748	12.7 28.0	36 28	35 27	23 50	31 40	31 40	3000	69 72	70 73	300 370
AUR 710/330-10	916	897	40.0	23	23	72	44	44	3000	74	75	390
AUR 800/280-8	816	-	28.0	30	-	50	37	-	3000	74	-	470
AUR 800/330-10	1042	-	40.0	27	-	72	42	-	3000	76	-	520
AUR 1000/403-6	909 1139	890 1115	27.0 40.0	34 30	33 29	51 75	31 35	31 34	1500	68 70	69 71	660 710
AUR 1120/403-6	1055 1443 1568 1710	1033 1413 1535 1675	27.0 40.0 49.5 60.5	39 36 32 29	39 36 31 28	51 75 95 112	30 35 36 38	30 35 36 38	1500	68 70 71 72	69 71 72 73	730 780 830 980
AUR 1120/578-10	2016	1974	86.3	24	23	151	41	41	1500	74	75	1160
AUR 1250/403-6	981 1260 1596 1790	960 1234 1563 1753	27.0 40.0 49.5 60.5	38 32 33 30	37 31 32 30	51 75 95 112	26 29 33 35	26 29 33 35	1500	71 72 73 74	72 73 74 75	800 850 900 1050
AUR 1250/578-10	2087	2044	86.3	25	24	151	38	37	1500	76	77	1240
AUR 1400/403-6	1405 1635 1864	1376 1601 1826	40.0 49.5 60.5	36 33 31	35 33 31	75 95 112	28 30 32	27 29 31	1500	75 76 77	76 77 78	930 980 1130
AUR 1400/578-10	2283 2656	2236 2601	86.3 108.0	27 25	27 24	151 193	35 38	35 38	1500	79 80	80 81	1330 1670
AUR 1600/578-10	1886 2288	1847 2241	51.8 86.3	37 34	36 33	93 161	28 31	28 31	1000	77 79	78 80	1440 1650

Uni-directional tunnel fans type AUR

Fan type	Meas. thrust [N]	Motor rating [kW]	Thrust efficiency [N/kW]	Current [A] [3] 400 V, 50 Hz	Outlet velocity [m/s]	Sync. speed [RPM]	Sound pressure level [dB(A)] [1]	Estimated total weight [2] [kg]
AUZ 900/350-6	625 960	13 27	48 39	25 50	29 36	1500	64 68	761
AUZ 1000/350-6	650 1300	13 40	52 39	25 74	26 37	1500	68 74	809
AUZ 1120/350-6	730 1800	13 50	56 37	25 94	25 39	1500	73 78	995
AUZ 1250/350-6	770 1970	13 50	60 40	25 94	23 37	1500	78 80	1250

Uni-directional tunnel fans type AUZ

1. Sound data is calculated 10 m from fans and a 45° free field without fan deflectors and wire guards. Values are for inlet side.

2. Total weights depend on construction and accessories, and include fans and motors.

3. Other voltages and frequencies on request.

Fan type	Meas. thrust [N]		Motor rating [kW]	Thrust efficiency [N/kW]		Current [A] [3]	Outlet velocity [m/s]		Sync. speed [RPM]	Sound pressure level [dB(A)] [1]		Estimated total weight [2] [kg]
	F300	F400		F300	F400	400 V, 50 Hz	F300	F400		F300	F400	
ARC 630/280-8	340	333	12.7	27	26	23	30	30	3000	67	68	430
ARC 630/330-10	550	539	28.0	20	19	50	38	38	3000	70	71	500
ARC 710/280-8	360 650	353 637	12.7 28.0	28 23	28 23	23 50	28 37	27 37	3000	69 73	70 74	510 580
ARC 710/330-10	750	735	40.0	19	18	72	40	39	3000	75	76	630
ARC 800/280-8	720	-	28.0	26	-	50	35	-	3000	74	-	630
ARC 800/330-10	900	-	40.0	23	-	72	39	-	3000	76	-	680

Reversible tunnel fans type ARC

Fan type	Meas. thrust [N]		Motor rating [kW]	Thrust efficiency [N/kW]		Current [A] [3]	Outlet velocity [m/s]		Sync. speed [RPM]	Sound pressure level [dB(A)] [1]		Estimated total weight [2] [kg]
	F300	F400		F300	F400	400 V, 50 Hz	F300	F400		F300	F400	
ARR 630/280-8	370 550	362 539	12.7 28.0	29 20	29 19	23 50	32 38	31 38	3000	69 71	70 72	270 340
ARR 710/280-8	425 700	416 686	12.7 28.0	34 25	33 25	23 50	30 38	30 38	3000	71 73	72 74	270 340
ARR 710/330-10	800	784	40.0	20	20	72	41	41	3000	75	76	390
ARR 800/280-8	800	-	28.0	29	-	50	36	-	3000	75	-	470
ARR 800/330-10	1000	-	40.0	25	-	74	41	-	3000	77	-	520
ARR 1000/403-6	900 1043	806 -	27.0 40.0	31 26	30 -	51 75	30 33	29 -	1500	67 68	68 -	660 710
ARR 1120/403-6	931 1140 1302 1378	912 1080 - -	27.0 40.0 49.5 60.5	35 29 26 23	34 27 - -	51 75 95 112	28 31 33 34	28 30 - -	1500	69 71 72 73	70 72 - -	1010 1060 1150 1300
ARR 1120/578-10	1663	1460	86.3	19	17	151	38	35	1500	75	76	1400
ARR 1250/403-6	1036 1225 1319 1413	1015 1199 1292 1384	27.0 40.0 49.5 60.5	38 31 27 23	38 30 26 23	51 75 95 112	27 29 30 31	26 29 30 31	1500	76 77 78 79	77 78 79 80	780 830 920 1070
ARR 1250/578-10	1790	1753	86.3	21	20	151	35	35	1500	80	81	1170
ARR 1400/403-6	1290 1432 1584	1264 1402 1552	40.0 49.5 60.5	32 29 26	32 28 26	78 93 116	26 28 29	26 28 29	1500	79 79 80	80 80 81	980 1070 1220
ARR 1400/578-10	2050 2330	2008 2282	86.3 108.0	24 22	23 21	151 193	33 36	33 35	1500	83 84	84 85	1320 1680
ARR 1600/578-10	1702 2116	1522 -	51.8 86.3	33 25	29 -	93 161	27 30	25 -	1000	78 80	79 -	1380 1740

Reversible tunnel fans type ARR

1. Sound data is calculated for a distance of 10 m from fans and a 45° free field without fan deflectors and wire protection guards. Values are for inlet side.

2. Total weights are estimates and depend on the selected construction and accessories. The weights include fans and motors.

3. Other voltages and frequencies are available on request.

Quality and service

Rest assured

The NOVENCO tunnel fans are produced in accordance with NOVENCO's well-known quality standards. NOVENCO Building & Industry A/S is ISO certified and all fans are inspected and tested.

We offer the fans with optional technical guidance on installation, test of function and training of personnel.

Warranty

NOVENCO provides according to law a standard 12 months warranty from the product is sent from the factory. The warranty covers materials and manufacturing defects. Wear parts are not covered.
Extended warranty can be agreed upon.

Important

This document is provided 'as is'. NOVENCO Building & Industry A/S reserves the right to changes without further notice due to continuous product development.

Pictures in the catalogue may show products with accessories fitted.

The fans are designed for continuous operation. The following kinds of operation may cause fatigue break in the impellers and endanger people.

- Operation in stall area
- Operation with pulsating counter pressure – called pump mode
- Operation with exceedingly starts and steps

If in doubt, NOVENCO should be contacted to assess the suitability of the fans.

Patents and trademarks

Quality and environment

NOVENCO Building & Industry A/S is certified in accordance with ISO 9001 and 14001.

All NOVENCO Building & Industry's products are designed, developed and manufactured in Denmark.

info@novenco-building.com

+45 70 77 88 99

novenco-building.com

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