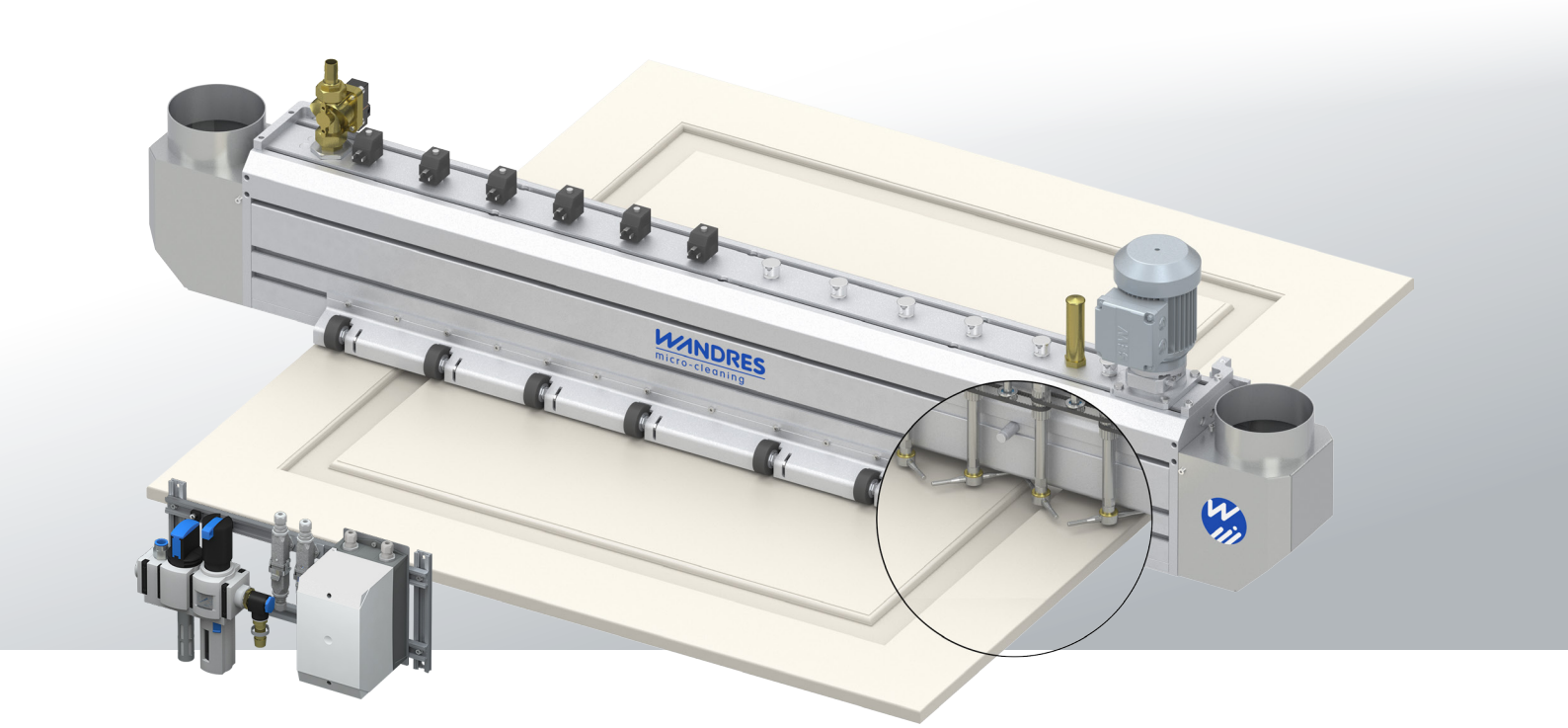
Tornado-Channel TKR 200.. and TKR 231..

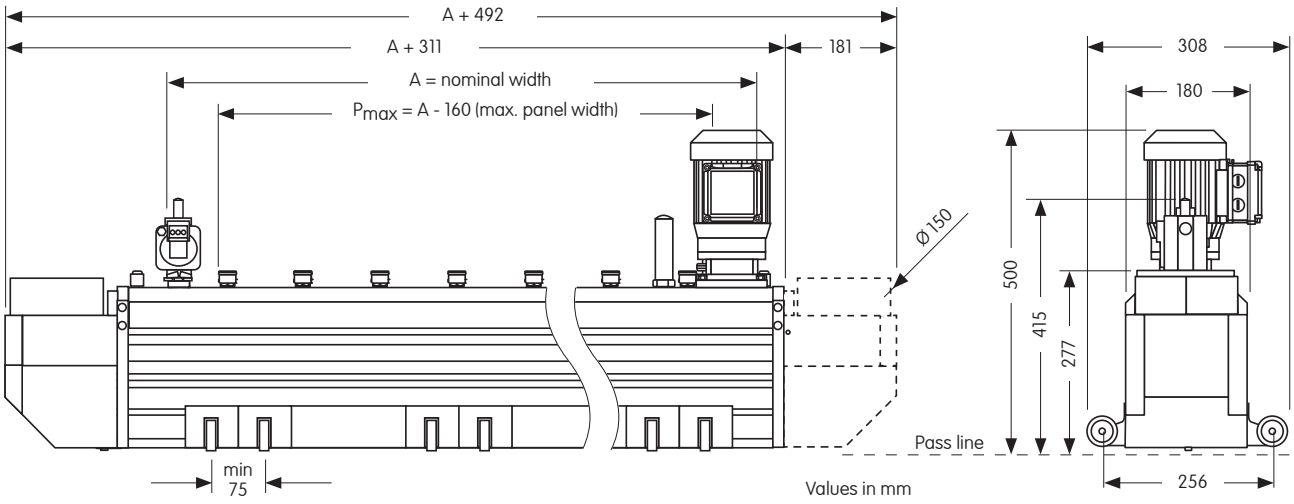


Brief description

The Tornado Channel type TKR 200.. is ideal for the air-assisted pre-cleaning process of surfaces with recesses and grinding grooves that have large amounts of dust e.g. after sanding.
The Tornado Channel type TKR 231.. may also remove larger tinsel (up to a Feret diameter of approx. 30 mm).
The rotating Tornado nozzles are synchronised electrically and driven via timing belts. The cleaning circles of the Tornado nozzles overlap thus providing for a highly efficient cleaning with compressed air.

Technical details

- U-shaped channel with angles at the infeed and at the outfeed to guide the air.
- Electrically driven, rotating compressed air nozzles with mechanical or electrical individual valve
- Rotation sensor and safety coupling for an emergency shut-off of the motor
- 1 or 2 suction connections Ø 150 mm facing upwards
- Incoming compressed air regulator with filter, pressure regulator and on-off valve for the compressed air supply (standard). Electrical/pneumatic cabinets are available as an option.

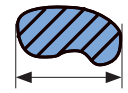


Order no.

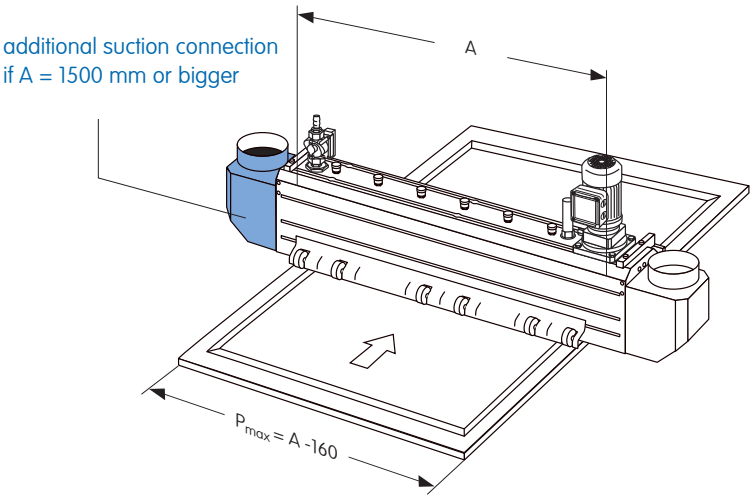
* if compressed air supply is 6 bar and if all Tornado nozzles are activated

TKR 200/V/A	TKR 231/V/A	Nominal width A in mm	Nominal width A in inches	Number of Tornado nozzles	Number of suction connections	Number of pressure rollers	Compressed air consumption Nm³/min*	Motor output W	
2271 -	2273 -								
- 003		400	15,75	3	1	-	0,15	250	
- 004		520	20,47	4	1	-	0,20	250	
- 005		650	25,59	5	1	6	0,25	250	
- 058		700	27,55	5	1	6	0,25	250	
- 006		850	33,46	6	1	8	0,30	250	
- 045		900	35,43	7	1	6	0,35	250	
- 007		1000	39,37	8	1	6	0,40	250	
- 008		1100	43,31	9	1	6	0,45	370	
- 031		1200	47,24	9	1	6	0,45	370	
- 009		1300	51,18	10	1	6	0,50	370	
- 030		1400	55,11	11	1	8	0,55	370	
- 010	- 010	1500	59,05	12	2	8	0,60	370	
- 011	- 011	1650	64,96	13	2	8	0,65	370	
- 059	- 059	1700	66,92	14	2	8	0,70	370	
- 012	- 012	1750	68,89	14	2	8	0,70	370	
- 032	- 032	1900	74,80	15	2	8	0,75	370	
- 013	- 013	2000	78,74	16	2	8	0,80	370	
- 033	- 033	2100	82,67	17	2	8	0,85	370	
- 014	- 014	2200	86,61	18	2	10	0,90	370	
- 056	- 056	2300	90,55	19	2	10	0,95	370	with profile reinforcement
- 015	- 015	2500	98,42	21	2	10	1,05	370	
- 050	- 050	2700	106,30	22	2	12	1,10	370	
- 016	- 016	2750	108,20	23	2	12	1,15	370	
- 060	- 060	2800	110,23	23	2	12	1,15	370	
- 036	- 036	2900	114,17	24	2	12	1,20	370	
- 017	- 017	3000	118,11	25	2	12	1,25	370	
- 018	- 018	3200	125,98	26	2	14	1,30	370	
- 039	- 039	3400	133,85	28	2	14	1,40	370	

The TKR 200 has oblong slots at the bottom and is suitable for particles with a max. Feret diameter of 8 mm.
The TKR 231 has triangular holes at the bottom and is suitable for particles with a max. Feret diameter of 30 mm.

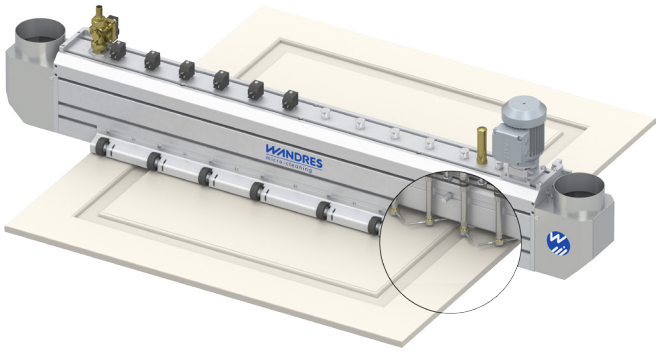


max. Feret diameter



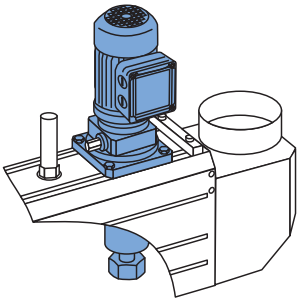
Ordering example

The subject panel has a max. width of P_{max} = 800 mm
Minimum Tornado Channel width is
$A_{min} = P_{max}$+ 160 mm = 960 mm
The most suitable Tornado Channel has
a nominal width A = 1000 mm
Order no. 2271-007 describes TKR 200/V/1000



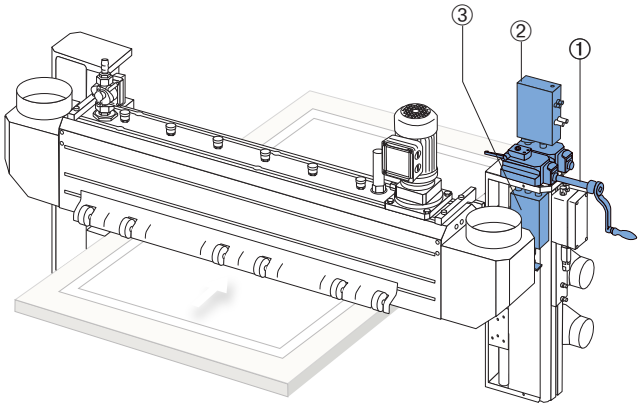
Functional description

The Tornado nozzles are driven electrically and synchronically via timing belts. They rotate with a constant high rotational speed.
As the nozzles' circular cleaning ranges overlap, no relevant cleaning gaps occur.
Compressed air is expelled from the nozzles with a speed of approx. 1000 m/s thus providing for an efficient air-assisted pre-cleaning process of the surface. Ideally, there is subsequent brush cleaning process using Sword Brushes and the Ingromat® system to eliminate minute particles and debris. The air-assisted pre-cleaning process reduces Ingromat® consumption considerably as only the remaining fine dust needs to be removed.



Rotation supervision and safety coupling

As sensor supervises the rotation movement of the last nozzle and thus the correct motions of all Tornado nozzles. In the event of an overload, there is a safety coupling that will shut off the motor as soon as rotational speed falls below a certain threshold.
The safety coupling may easily and rapidly be clicked back into place after a motor stop.



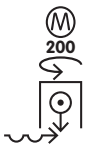
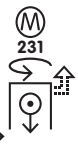
Height adjustment

The cleaning module is mounted at an adjustment frame in order to adjust the Tornado Channel to the thickness of the subject panel.

① HVM: Normally, adjustment takes place manually via a crank.

② HVE: An electrical actuator (option) provides for an automatic thickness adjustment in combination with the overall control of the line.

③ HVP: Additionally, the cleaning module may be rapidly removed from the surface with the help of a pneumatic cylinder (e.g. for crash situations). Different versions with different strokes are available. Both the mechanical and the electrical height adjustment may be combined with the pneumatic quick adjustment.

Technical data	TKR 200.. 	TKR 231.. 
Electrical details		
Drive Tornado nozzles	**A** ≤ 1000 mm 1 x 0.25 KW SEW-Motor IP 54, UL compatible 50 Hz; △ 220 – 240 V; 1.27 A ⅄ 380 – 415 V; 0.73 A 60 Hz; △ 240 – 266 V; 1.15 A ⅄ 415 – 480 V; 0.66 A	**A** > 1000 mm 1 x 0.37 kW SEW-Motor IP 54, UL compatible 50 Hz; △ 220 – 242 V; 2.15 A ⅄ 380 – 420 V; 1.23 A 60 Hz; △ 254 – 277 V; 1.83 A ⅄ 440 – 480 V; 1.06 A
Rotation sensor	Break contact DC-PNP on Harting plug, 2 impulses/rotation	
Sensor connection	24 V DC; 200 mA	
Sensor evaluation	via PLC with high-speed counter: Motor is stopped and an error message is indicated if there are no more impulses or if the rotational speed drops below the threshold of 1000 rpm within 3 seconds.	
Main valve Tornado Channel	2/2 directional valve; 1 x 24 V DC; 11 W	
Magnetic valves Tornado nozzles	24 V DC / 0.5 A each	
Pneumatic details		
Compressed air quality	filtered (particle size < 40µm), oil free (residual oil < 1.5 mg/Nm³ at 24° C)	
Compressed air connection	1 x G 3/4 female thread; 6 bar	
Compressed air consumption per Tornado nozzle	0.05 Nm³/min	
Compressed air consumption total channel	see table on page 2 - in order to reduce consumption, we recommend to install electrical individual valves and a perfectly matched control via the overall process control.	
Suction requirements		
Suction connection	**A** < 1500 mm 1 x Ø 150 mm	**A** ≥ 1500 mm 2 x Ø 150 mm
Suction air volume flow	1 x 26 Nm^3/min	2 x 26 Nm^3/min
Vacuum	min. –500 Pa	
Flow velocity	min. 25 m/s	
Acoustic emission		
Max. sound pressure level	85 dB(A) if all Tornado nozzles are activated The sound pressure level depends on the number of activated nozzles, the surface features and the geometry of the subject panel.	
Transport speed		
Max. transport speed	30 m/min, if speed exceeds 30 m/min, some particles may remain in recesses	
Dimensions		
Minimum panel length L / panel width P	L_{min}= 300 mm	P_{max} = Nominal width A – 160 mm
Distance Tornado Channel to surface	TCD = 2,5 mm	

Technical information is subject to changes

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